UNIT ONE

Energy





Lessons of the unit :

1. Light.
2. Seeing coloured objects.
3. Magnetism.
4. Magnetism and electricity.

Unit Objectives : By the end of this unit, you will be able to :

- Perform simple experiments to indicate some light properties.
- Compare between transparent, translucent and opaque objects using practical experiments.
- Explain how shadows form.
- Explain how transparent objects can be seen in different colours.
- Explain how opaque objects can be seen in different colours.
- Indentify the primary and secondary colours and how coloured lights are mixed up.
- Perform experiments to deduce the properties of the natural magnet.
- Classify some materials according to their capability of magnetization.
- Indentify the importance of the compass and its structure.
- Indentify the magnetic effect of electric current (electromagnet).
- Perform experiments to know the basis of operating the dynamo (electric generator).



Lesson 1

Light

- As you studied before that energy is the ability to do work or make a change.
- There are many forms of energy like :

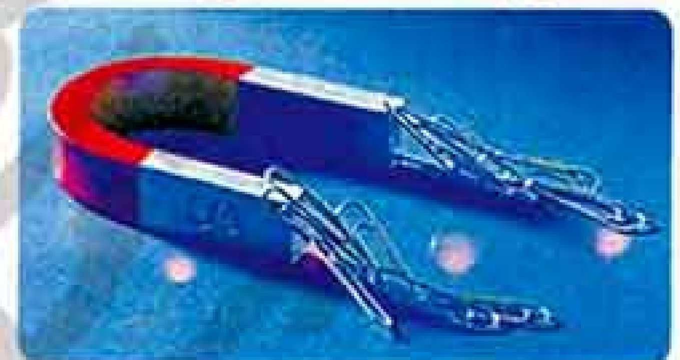
Sound energy



Electric energy



Magnetic energy



- Light is one of the forms of energy.
- Do you think that all these forms of energy can be seen ?

  The light energy is the only form of energy that can be seen.
- Light energy that can be seen is called "The visible spectrum".

The visible spectrum:

It is the light energy that can be seen.

– Now, we must study : ❶ **Sources of light.** ❷ **Properties of light.**

sound energy	طاقة الصوت	properties	صفات	sources	مصادر
visible spectrum	الطيف المرئي				

1 Lesson

Sources of light


1 The Sun
(The main source of light on the Earth)


2 Candles


3 Kerosene lamps


4 Electric lamps


Note

The moon is not considered as a source of light as it reflects the sunlight that falls on its surface.



Properties of light

FIRST
Travelling of light in straight lines.

SECOND
Transmitting of light through different materials.

THIRD
Light reflection.

FOURTH
Light refraction.

FIFTH
Light separation (splitting of light).

Now, we will study each property.

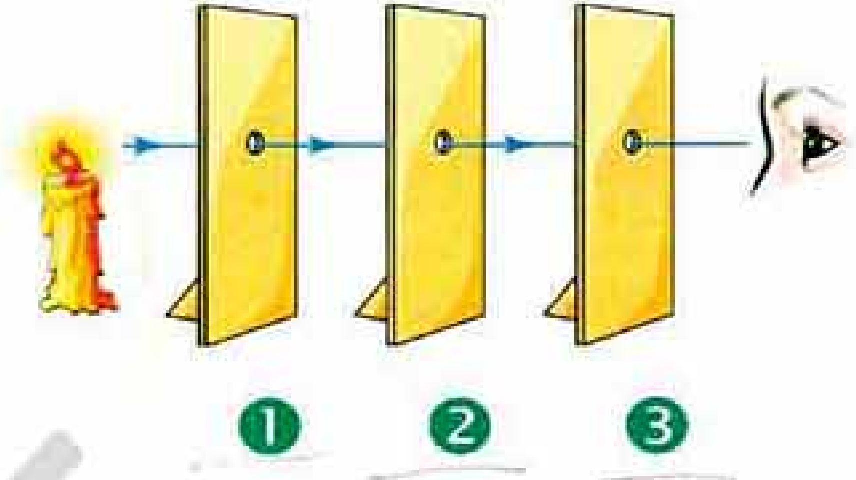
refraction	إنكسار	separation / splitting	إنفصال	reflection	إنعكاس
straight lines	خطوط مستقيمة	transmit	ينفذ		

First Travelling (propagation) of light in straight lines

Activity 1 To prove that light travels in straight lines.

Steps:

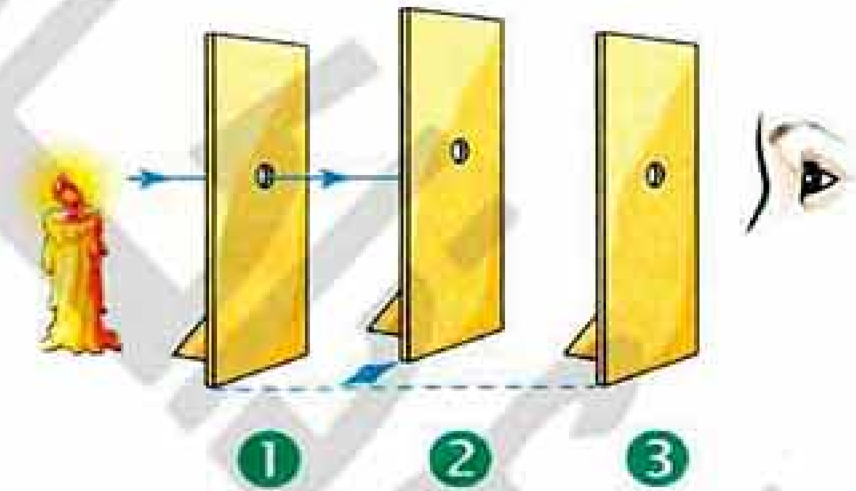
1. Bring three wooden or carton partitions (screens), each one has a centered hole.
2. Put them in a row in front of a lightened candle, where all holes and the flame of the candle are on the same straight line.
3. Look at the flame through the hole of the third screen.



Observation:

You can see the flame of the candle.

4. Move the second screen to the right side or the left side.



Observation:

You can't see the flame.

Inference (Conclusion):

Light travels (propagates) in straight lines.

G.R.

Moon is not considered as a source of light.

Because the moon light is the reflection of the sunlight that falls on its surface.

row	صف	inference	إستنتاج	partition / screen	حاجز / حائل
propagation	انتشار	flame	لهب	centered hole	ثقب فى المركز

1 Lesson

As a result of travelling of light in straight lines, some phenomena happen as:

1. Formation of images through narrow holes.
2. Formation of shadow.

1 Formation of images through narrow holes

The idea of photographic (pin-hole) camera is based on the idea of the following activity.



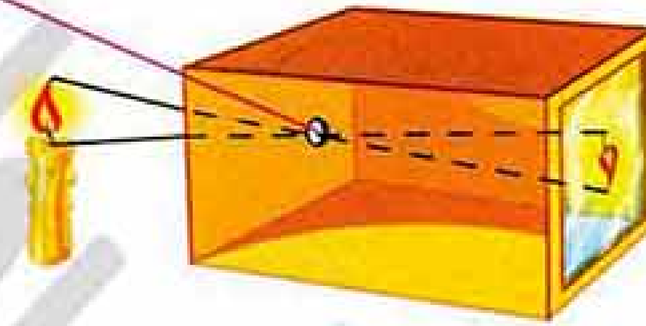
Activity 2 To prove that formation of images through narrow holes is due to travelling of light in straight lines.

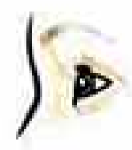




Steps:

1. Remove one side of a carton box and replace it with a piece of semi-transparent paper.
2. Make a small hole in the opposite side of the semi-transparent paper.





3. Darken the room, then put a lightened candle in front of the hole at a certain distance and look at the semi-transparent paper.
4. Move the candle forward and backward until you see a clear picture of the candle flame on the semi-transparent paper.

Observation:

A minimized and inverted image of the candle flame is formed on the semi-transparent paper.

Inference (Conclusion):

Formation of images through narrow holes is due to the travelling of light in straight lines.

G.R.

The formation of images through narrow holes.
Because light travels in straight lines.

minimized	مصغرة	inverted	مقلوبة	semi-transparent	شبه شفاف
darken	يُظلم	shadow	ظل	narrow holes	ثقوب ضيقة
phenomena	ظواهر	formation	تكوّن		



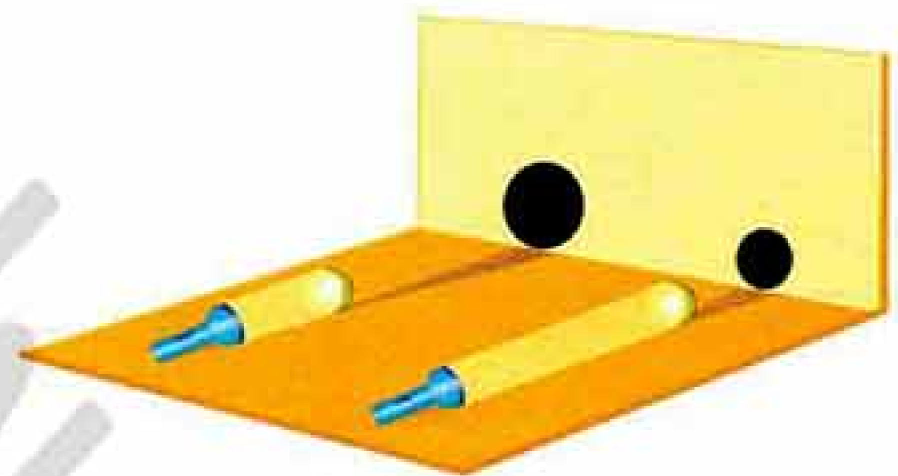
2 Formation of shadow



- When you darken the room and put your hand between a wall and a torch , a darkened area that is called shadow is formed on the wall.

Shadow:

It is the darkened area which is formed as a result of the falling of light on an opaque object.



- The shadow formation is an evidence that light travels in straight lines.
- The shadow area is changed by changing the position of the object with respect to the light source.
- The nearer object to the light source has the bigger shadow.

Do you know ?

- Laser is a light beam that travels long distances without fainting.
- Laser lights are used in means of communication, medicine and computers.

Exercise

Complete the following:

1. The image that is formed through narrow holes is .... and .... as a result of travelling light in ....

2. .... is a darkened area which is formed when light falls on an opaque object.

3. Shadow is formed due to ....

G.R.

Shadow of an opaque body is formed when light falls on it.
Because light travels in straight lines.

light beam	حزمة ضوء	opaque	مُعتم	evidence	دليل
faint	باهت / ضعيف	with repect to	فيما يتعلق بـ	means of communication	وسائل الإتصال

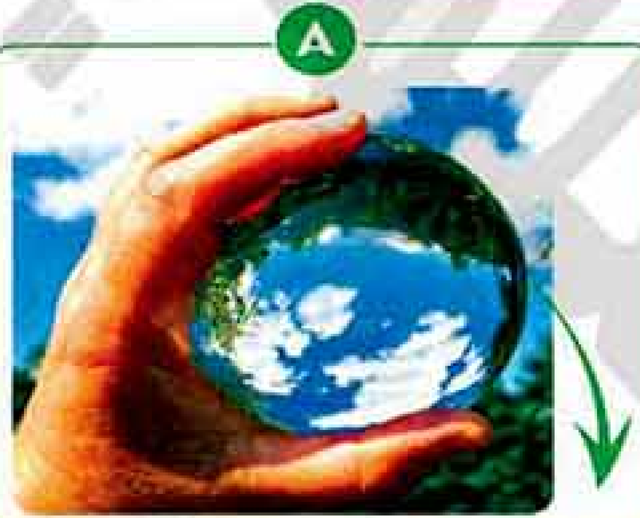
1
Lesson

Second Transmitting of light through different materials

Light transmits through different materials with variable degrees.

Materials can be classified according to their ability to transmit light into :

A



Transparent materials

They are the materials which allow most light to pass through and objects can be seen clearly (in full details) through them.

Examples:
- Clear glass.
- Air.
- Clear water.
- Transparent plastic.

B



Semi-transparent (translucent) materials

They are the materials which allow some light to pass through and objects can be seen through them less clearly than the transparent one.

Examples:
- Frosted glass.
- Tissue paper.

C



Opaque materials

They are the materials that don't allow light to pass through and objects can't be seen through them.

Examples:
- Rocks.
- Aluminium foil.
- Wood.
- Carton.

Do you know ?

Opaque materials are used to cover windows of darkened photographic rooms.

Try to answer Test yourself 1



variable	مختلفة	frosted	مُصنفر	allow	يسمح
transparent	شفاف	photographic rooms	غرف تصوير	semi-transparent (translucent)	شبه شفاف
tissue paper	ورق مناديل	full details	كامل التفاصيل		

G.R.

- **Our bodies are opaque materials.**
  Because they don't allow light to transmit through and objects can't be seen behind them.
- **Clear glass is a transparent material.**
  Because it allows most light to pass through and objects can be seen clearly through it.
- **We can't see through the foil sheet.**
  Because foil sheet is an opaque material.

Exercise

Compare between transparent, translucent and opaque materials :

Points of comparison	*Transparent material*	*Translucent material*	*Opaque material*
• *Definition:*	....	....	....
• *Examples:*	....	....	....

Third Light reflection



Light reflection:

It is the bouncing (returning back) of light rays when light falls on a reflecting surface.

- Light reflection occurs in the presence of :

1. A source of light.
2. A reflecting surface.

How can you see the surrounding objects ?

When light falls on objects, light reflection occurs and reaches our eyes causing the vision of these objects.

vision	الإبصار	bouncing / returning back	إرتداد	reflecting surface	سطح عاكس

1
Lesson

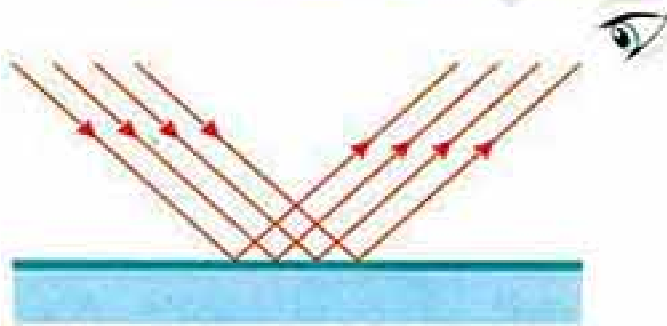
Types of light reflection

Light reflection can be divided into :

A Regular reflection

It is the reflection of light when it falls on a smooth and shiny reflecting surface, where light rays are reflected directly in one direction.





Smooth surface

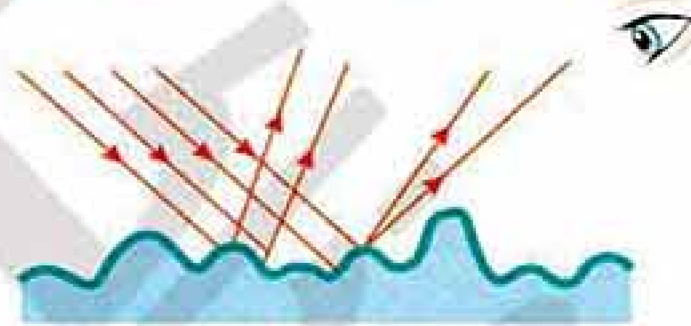
Examples :

1. Reflection of light when it falls on a mirror surface.
2. Reflection of light when it falls on a glass surface.

B Irregular reflection

It is the reflection of light when it falls on a rough reflecting surface, where light rays are reflected and scattered in different directions.





Rough surface

Example :

Reflection of light when it falls on any rough surface as a piece of white paper (which contains protrusions and tiny holes).

Note

When you look in a mirror, you can see your image due to the regular light reflection, where the distance between your body and the mirror is equal to the distance between your image and the mirror.



regular	منتظم	smooth	ناعم	rough	خشن	protrusions	بروز/نتوءات
irregular	غير منتظم	scattered	إنتشرت	shiny	لامع		

G.R.

- **We can't see in the dark.**
  Because there is no light falling on objects and reflecting on our eyes causing vision.
- **You can see your image in a plane mirror.**
  Due to the reflection of light.



Question

Choose the correct answer:

1. *All the following surfaces cause a regular reflection when light falls on them except .... surface.*
   a. glass *b. mirror* *c. paper* *d. shiny*
2. *The reflection of light when it falls on a rough surface is a / an ....*
   a. regular reflection. *b. irregular reflection.*
   c. transparent material. *d. opaque material.*
3. *When you look in a mirror, the distance between your body and the mirror is .... the distance between your image and the mirror.*
   a. longer than *b. shorter than* *c. equal to* *d. (a), (b) and (c)*

Answer

1. c. paper *2. b. irregular reflection.* *3. c. equal to*

Fourth Light refraction

Light refraction:

It is the change in the direction of light rays when light passes through the separating surface between two different transparent media due to the change in the light speed.

direction	اتجاه	separating surface	السطح الفاصل	transparent media	وسط شفاف
light speed	سرعة الضوء	luminous	مضئ		



1 Lesson

Example :

The appearance of a spoon or a pencil broken when we put it in a cup of water.

The reason :



- The reflected light rays from the part of the pencil above water travel through air only so, they don't refract.
- But, the light rays that are reflected from the part of the pencil inside water travel firstly through water, then through air.

(The light speed through air is faster than that through water.)

SO, this change in the speed of light rays causes their refraction (changing in their direction) and seeing the pencil broken.

G.R.

A spoon appears broken when you put it in a transparent cup of water.

Due to the refraction of light.

Fifth Light separation (splitting of light)

White light consists of seven spectrum colours , so we can separate it into seven colours by using a glass prism.

Light separation:

It is the separation (splitting) of white light into seven spectrum colours.



Activity 3 To prove that white light consists of seven spectrum colours.




Step:

Face a glass prism to the sunlight and move it until you recieve the sunlight coming from it on a white paper.



Observation:

Seven spectrum colours are formed on the paper.

spectrum colours	ألوان الطيف	glass prism	منشور زجاجى	recieve	يستقبل
appearance	ظهور				

Inferences :

Sunlight (white light) is formed of seven spectrum colours which are :

Red , Orange , Yellow , Green , Blue , Indigo , Violet



- White light can be also analyzed into seven spectrum colours by the drops of rain water forming rainbow, that appears in the sky during rainfall.
- **SO,** the drops of rain water act as a glass prism.

G.R.

The formation of spectrum colours.
Due to splitting of white light into seven spectrum colours.



Try to answer Test yourself 2

indigo	نيلى	violet	بنفسجى	analyzed	يتحلل
rainbow	قوس قزح	rainfall	سقوط الأمطار		

Remember



- **The visible spectrum :** It is the light energy that can be seen.
- The Sun is the main source of light on the Earth.
- Sources of light are the Sun, candles, kerosene lamps and electric lamps.
- **Properties of light:**
  1. Travelling of light in straight lines.
  2. Transmitting of light through different materials.
  3. Light reflection.
  4. Light refraction.
  5. Light separation.
- **Shadow :** It is the darkened area which is formed as a result of the falling of light on an opaque object.
- Transparent and translucent materials allow light to pass through, while opaque materials don't allow light to pass through.
- **Types of light reflection are :**
  1. Regular reflection.
  2. Irregular reflection.
- The light speed through air is faster than that through water.
- White light consists of seven spectrum colours which are :
  Red - Orange - Yellow - Green - Blue - Indigo - Violet.



Questions on lesson one

1. Choose the correct answer:

1. The light rays that can be seen are called ....
   a. visible spectrum. b. infrared rays.
   c. ultraviolet rays. d. all the previous answers.
2. .... is (are) from the light sources.
   a. Electric lamps b. Lightened candles
   c. The Sun d. All the previous answers
3. Light transmits in .... lines.
   a. curved b. broken
   c. straight d. zigzag
4. Formation of images through narrow holes is due to ....
   a. travelling of light in straight lines. b. light reflection.
   c. light refraction. d. separation of light.
5. The image of the object that is formed by the camera is ....
   a. inverted. b. minimized. c. enlarged. d. (a) and (b).
6. Light travels in straight lines. This principle is the idea of making ....
   a. camera. b. electric heater.
   c. electric iron. d. radio.
7. When light falls on an opaque body, ... is formed.
   a. no image b. white light
   c. a shadow d. an inverted image
8. The farther object to the light source has the .... shadow.
   a. bigger b. smaller
   c. fainted d. all the previous answers
9. Materials that we can see objects less clearly through are called ....
   a. opaque materials. b. transparent materials.
   c. semi-transparent materials. d. spectrum colours.
10. .... materials don't allow light to travel through.
    a. Transparent b. Translucent
    c. Semi-transparent d. Opaque
11. All the following are examples of transparent materials except ....
    a. air. b. tissue paper. c. glass. d. clear water.

1
Lesson

12. All the following are examples of opaque materials except ....
a. frosted glass. b. rocks. c. carton paper. d. wood.
13. Light can be transmitted through .... materials.
a. transparent b. semi-transparent
c. opaque d. (a) and (b)
14. We can see objects due to .... of light on them.
a. reflection b. refraction
c. shadow d. spectrum colours
15. The light bouncing from a plane mirror is known as ....
a. regular refraction. b. regular reflection.
c. irregular reflection. d. irregular refraction.
16. The light bouncing from a white paper is known as ....
a. regular reflection. b. irregular refraction.
c. irregular reflection. d. regular refraction.
17. Light is reflected .... when it falls on a rough surface.
a. regularly b. irregularly c. and refracted d. and splitted
18. If you put an object at a distance of 20 cm. in front of the mirror, the distance between the object and its image equals .... cm.
a. 10 b. 20 c. 30 d. 40
19. If you put an object at a distance of 30 cm. in front of a mirror, the distance between the image and the mirror equals .... cm.
a. 10 b. 30 c. 60 d. 20
20. Light is reflected .... when it falls on a smooth bright surface.
a. regularly b. irregularly c. and refracted d. and scattered
21. A pencil seems broken when it is placed in a glass cup of water due to the .... of light.
a. reflection b. refraction c. separation d. absorption
22. The speed of light in air is .... that in water.
a. faster than b. slower than c. equal to d. half
23. The glass prism separates the white light into .... spectrum colours.
a. seven b. six c. eight d. ten
24. The white light is separated into seven spectrum colours by using ....
a. telescope. b. mirror.
c. glass prism. d. no correct answer.
25. In spectrum colours, the yellow colour lies between ....
a. green and indigo colours. b. orange and green colours.
c. blue and violet colours. d. red and orange colours.

2. Choose from column (B) what suits it in column (A):

(1)

(A)	(B)
1. Reflection of light 2. Refraction of light 3. Rainbow	a. happens when sunlight passes from drops of rain water to air. b. occurs when light transfers from one transparent medium to another different medium. c. happens when light travels through narrow holes. d. happens when light falls on a mirror surface.

1. .... 2. .... 3. ....

(2)

(A)	(B)
1. Light 2. Shadow 3. Glass 4. Carton paper 5. Glass prism	a. Opaque material. b. Separates light into seven colours. c. Transparent material. d. Propagates in straight lines. e. Reflects sunlight. f. A darkened area formed behind a body exposed to light.

1. .... 2. .... 3. ....
4. .... 5. ....

3. Put (✓) in front of the correct statement and (×) in front of the incorrect one, then correct it :

1. The visible spectrum is the light energy that can be seen. ( )
2. 📖 Light transmits in straight lines. ( )
3. 📖 The formed image through narrow holes is inverted. ( )
4. The formation of shadow indicates that light travels in curved lines. ( )
5. The nearer object to the light source has the bigger shadow. ( )
6. Frosted light bulbs are examples of transparent materials. ( )
7. Semi-transparent materials let most light pass through and we can see objects clearly through them. ( )
8. Air and water are transparent materials. ( )
9. Carton paper is an opaque material. ( )

1
Lesson

10. A sheet of aluminium foil is a transparent material, while the frosted glass is a semi-transparent material. ( )
11. The presence of a light source and a reflecting surface is necessary for light reflection. ( )
12. In the irregular reflection, the light rays are reflected and scattered in different directions. ( )
13. The moon seems luminous as it reflects the sunlight. ( )
14. A spoon appears broken when it is placed in a cup of water due to the refraction of light. ( )
15. Refraction of light is the bouncing of light after falling on an object. ( )
16. When light passes from air to glass, it refracts. ( )
17. A beam of light is refracted when it falls on a plane mirror. ( )
18. The glass prism is used to separate the white light into seven spectrum colours. ( )
19. Rainbow is formed in the sky before rainfall. ( )
20. When the sunlight passes through the drops of rain water, rainbow is formed. ( )
21. Red is the first colour in the spectrum colours, but violet is the last colour in the spectrum colours. ( )

4. Write the scientific term of each of the following:

1. It is the light energy that can be seen. (..............)
2. The main source of light on the Earth. (..............)
3. A darkened area formed when light falls on an opaque object. (..............)
4. The materials which you can see objects clearly behind them and in full details. (..............)
5. The material which lets most light to pass through it and we can see objects clearly through it. (..............)
6. The material which allows some light to pass through it and we can see objects through it less clearly. (..............)
7. The material that doesn't allow light to travel through it and objects can't be seen through. (..............)
8. The kind of materials that can be used to cover windows of photographic rooms. (..............)
9. The materials that form a clear shadow with a sharp edge when light falls on them. (..............)

10. The materials through which light can't be transmitted. (..............)
11. The bouncing of light rays after falling on a surface. (..............)
12. The returning back of light rays when they fall on a smooth and shiny surface. (..............)
13. The reflection of light rays when they fall on a mirror. (..............)
14. The reflection of light on a rough surface, where the light rays are reflected and scattered in different directions. (..............)
15. The reflection of light on a piece of white paper in different directions. (..............)
16. The change in the direction of light rays when light passes from a transparent medium to another transparent medium. (..............)
17. A beautiful phenomenon occurs in the sky during raining in a sunny day. (..............)
18. A tool used to separate the white light into seven spectrum colours. (..............)
19. The seven colours of light which sunlight is made up of. (..............)

5. Complete the following statements:

1. .... is the main source of light on the Earth.
2. There are forms of energy which can't be seen such as .... , ... and ....
3. Light travels in .... lines.
4. .... , ... and .... are from the properties of light.
5. Formation of .... through narrow holes and formation of .... are from the applications of travelling light in straight lines.
6. The object's image that is formed through narrow holes (pin-hole camera) is .... and ....
7. .... is a darkened area that is formed when light falls on an opaque object.
8. Shadow is a .... area that is formed due to the travelling of light in ....
9. The nearer object to the light source has the .... shadow.
10. Materials can be classified according to their ability to transmit light into .... , ... and .... materials.
11. The material which allows most light to transmit through is called ....
12. Light can easily be transmitted through .... and .... materials.
13. The material which we can see objects clearly behind it is called ....

1
Lesson

14. .... materials allow some light to pass through, but .... materials don't allow light to pass through.
15. The clear glass cup is an example of .... materials , while a piece of rock is an example of .... materials.
16. Light bouncing after falling on an object is called ....
17. Light reflects regularly when it falls on .... surface.
18. .... and .... are the types of the light reflection.
19. .... is the reflection of light on a smooth and shiny reflecting surface.
20. .... is the reflection of light on a rough reflecting surface.
21. In the .... reflection, the light rays are reflected directly in one direction.
22. In the .... reflection, the light rays are reflected and scattered in different directions.
23. If you stand at 50 cm. in front of a plane mirror, your image is formed at .... cm. from the mirror.
24. The change in the direction of light rays when they pass through the separating surface between two different transparent media is called ....
25. Light .... when it falls on a mirror ,while it .... when it passes from water to air.
26. The pen that is put in water seems broken due to ....
27. When a light ray passes from a glass rod to air, it ....
28. White light can split into .... colours that are called ....
29. .... is a phenomenon produced due to the separation of white light into seven colours during raining.
30. Sunlight is an excellent example of .... light.
31. In spectrum colours, the .... colour lies between the red colour and the yellow colour.
32. The spectrum colours start with the .... colour and end with the .... colour.
33. Sunlight is separated into .... colours by passing it through a ....
34. .... , orange, ... , green, blue, ... and violet are the seven spectrum colours.

6. Give reasons for the following :

1. The moon is not considered as a source of light.

....

2. The moon seems luminous.

....

3. The formation of images through narrow holes.

4. Shadow of an opaque body is formed when light falls on it.

5. A clear glass and transparent plastic are transparent materials.

6. A tissue paper is a translucent material.

7. Aluminium foil is an opaque material.

8. Objects can be seen clearly through transparent materials.

9. Objects cannot be seen clearly through the frosted glass.

10. We can't see any object behind wood.

11. You can see your image in a plane mirror.

12. Seeing the pen bending in a transparent cup of water.

13. A spoon appears broken when it is placed in a cup of water.

14. A light beam changes its direction when it passes from air to water.

15. White light can be separated.

16. The rainbow appears in the sky during rainfall.

7. What is meant by ...?

1. Visible spectrum.

2. Shadow.

3. Transparent material.

4. Translucent material.

5. Opaque material.

6. Light reflection.

7. Regular reflection.

8. Irregular reflection.

9. Refraction of light.

10. Light separation.

8. What happens when ...?

1. You look at a lightened candle through three screens containing holes, where the holes of screens are on one straight line.
2. You place an opaque object between a light source and a screen.
3. You look at a picture through a transparent material.
4. You look at a picture through a frosted glass.
5. You look at a picture through a metallic sheet as aluminium foil.
6. You look at a mirror.
7. You look at a spoon that was put in a beaker containing water.
8. White light passes through a glass prism.

9. Sunlight passes from drops of rain water to air during raining.

....

9. Compare between:

1. Transparent, translucent and opaque materials.

....

....

....

2. Regular reflection and irregular reflection.

....

....

....

3. Reflection and refraction of light.

....

....

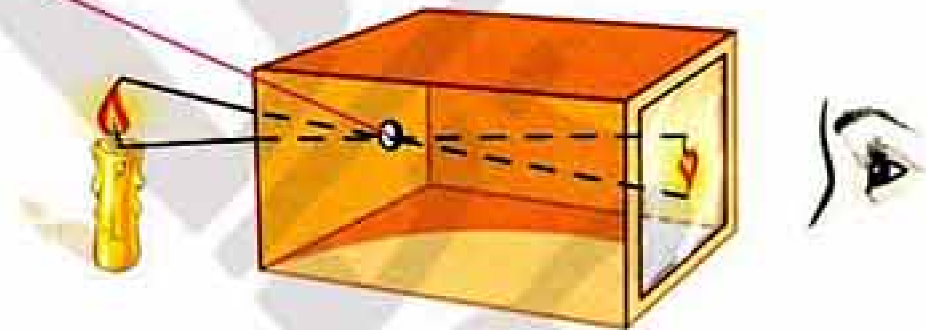
10. Look at the opposite figure, then answer:

1. What is your observation ?

....

2. What is your inference ?

....



11. Look at the following figures, then complete:

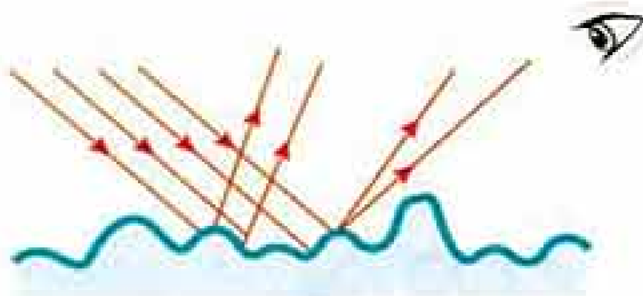


Fig. (a)

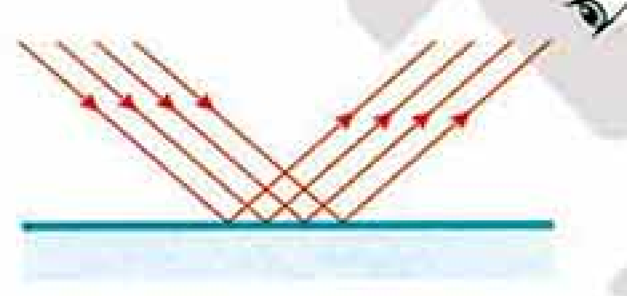


Fig. (b)

1. The two figures represent two types of light ....
2. Figure (a) represents ....
3. Figure (b) represents ....

1
Lesson

12. **Look at the opposite figure, then answer:**



1. The opposite figure indicates the .... phenomena.
2. The speed of light through air is .... its speed through water.
3. Why does the pencil appear broken ?

....

13. **Look at the opposite figure, then answer:**



1. The figure shows the separation of .... into .... by ....
2. Mention the names of the spectrum colours.

....

....

Timss Questions





1. Mariam watches a sunrise from across a calm lake. She sees the Sun in the sky and the Sun in the lake as shown in the picture.

Why does Mariam see the Sun in the lake ? ....

a. The sunlight warms that part of the lake.
b. The sky spreads sunlight over the lake.
c. The lake water reflects the sunlight.
d. Clouds reflect sunlight into the lake.

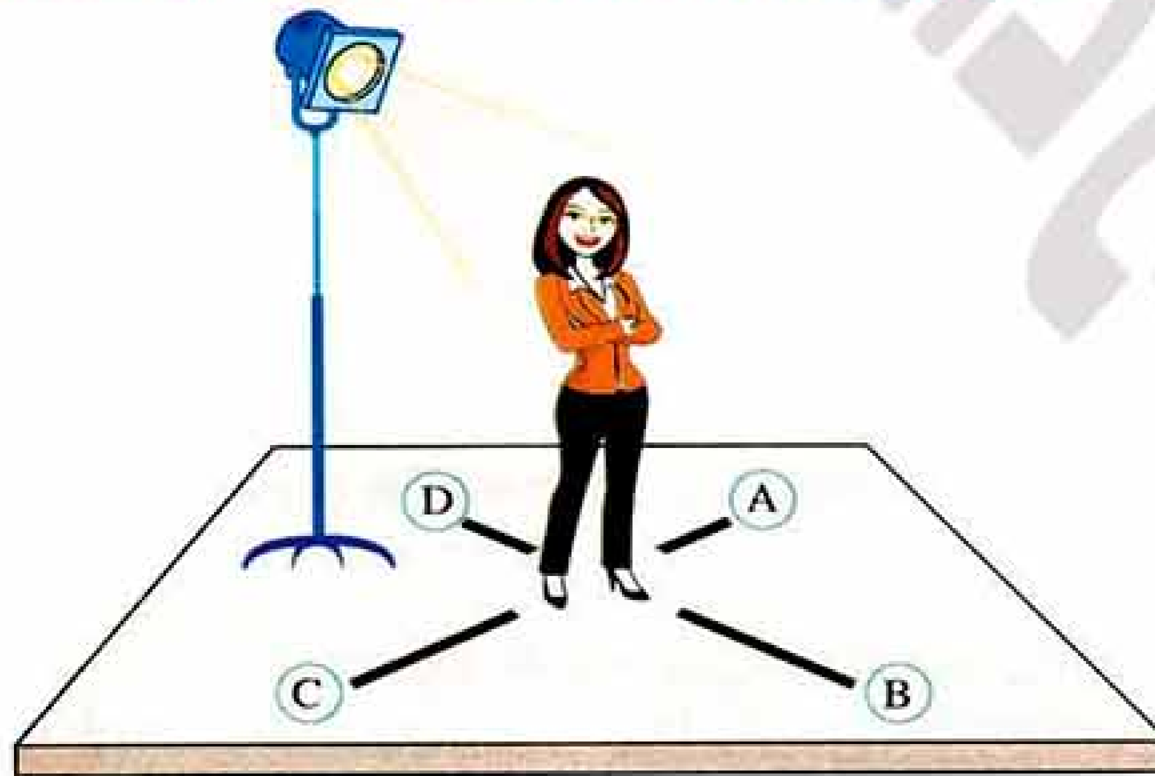
2. If you see the image of an object at a distance of 20 cm. from the mirror. Calculate the distance between the object and its image ? ....

a. 4 cm. b. 40 cm. c. 50 cm. d. 20 cm.

3. If you have a book and a source of light. Are these materials suitable for occurring ....

a. regular reflection. b. light refraction.
c. irregular reflection. d. splitting of light.

4. A spotlight shines on a girl as shown in the figure.



Which line would the shadow of the girl be seen along ? ....

a. Ⓐ b. Ⓑ
c. Ⓒ d. Ⓓ



Lesson 2 Seeing coloured objects

- You know that we can use the glass prism to separate the white light into seven spectrum colours, which are :

Red · Orange · Yellow · Green · Blue · Indigo · Violet

- And when the seven light colours are mixed together, the white light is produced again.



Activity 1 To prove that mixing the seven light spectrum colours produces white light.

Tools:

A piece of construction white paper – colours – scissors – a protractor – a pencil.

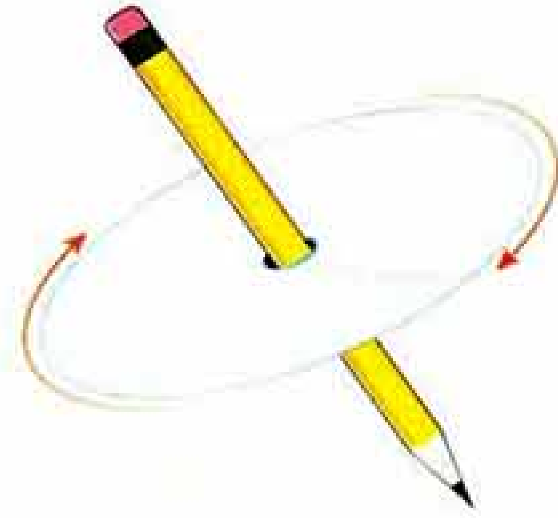
Steps:

1. Cut the construction paper in a shape of a disk by using scissors.
2. Divide the disk into seven equal parts by using the protractor.
3. Colour the seven parts using the seven spectrum colours in the same order.



mixing خلط scissors مقص protractor منقلة

4. Make a small hole in the centre of the disk, then pass your pencil through it.
5. Rotate the disk quickly.



Observation:

The coloured disk seems white.

Inference:

Mixing the seven light spectrum colours produces the white light.

But, how can you see coloured objects ?

Seeing the coloured objects

First Seeing the coloured transparent and translucent objects

- The transparent and translucent objects allow light to pass through them.
- When the white light strikes the coloured transparent or translucent object, this object absorbs all colours of light (spectrum colours) , but it permits its own colour only to pass through it.

SO, the colours of the transparent and translucent objects are the same colour of the transmitted light through them.

Example :

Green transparent glass bottle that appears green as it absorbs all light colours and allows the green light only to transmit through it.



G.R.

The red transparent ruler appears red when white light falls on it.
Because it absorbs all light colours that fall on it and allows the red light only to transmit through it.

coloured objects	الأجسام الملونة	absorb	يمتص	transmit	ينفُذ
strike	يصطدم بـ	permit	يسمح		

2 Lesson

Second Seeing the coloured opaque objects

- The opaque objects don't allow light to transmit through them.

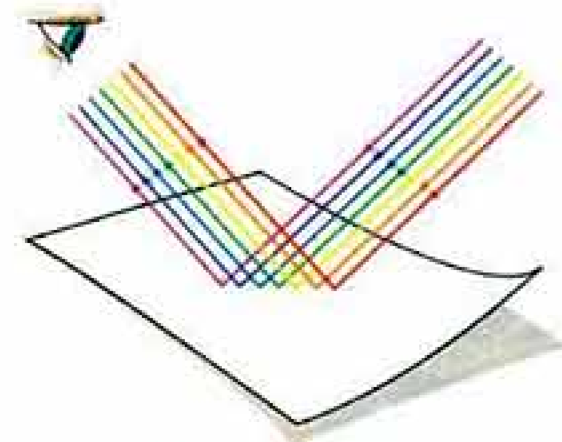
- **The opaque objects are divided into :**

A- White objects. B- Black objects. C- Coloured objects.

A Seeing the white opaque objects

- When white light strikes a **white opaque object**, this object reflects all light colours.

SO, it appears in the same colour of light that falls on it.



White opaque object

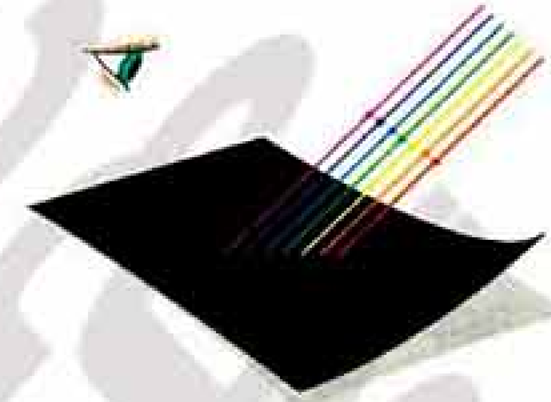
G.R.

We wear white clothes in summer.

Because white clothes reflect all light colours that fall on them causing decrease in the feeling of heat.

B Seeing the black opaque objects

- When white light strikes a **black opaque object**, this object absorbs all light colours and doesn't reflect any colour, so it appears black.



Black opaque object

G.R.

We must wear black (dark) clothes in winter.

Because black clothes absorb all light colours that fall on them causing the feeling of warmth.

feeling of heat الشعور بالحرارة warmth الدفء

C Seeing the coloured opaque objects

- When the white light strikes a **coloured opaque object** , this object absorbs all light colours and reflects its own colour only.

SO, the colour of the coloured opaque object is the colour of the reflected light.

Example:

The banana fruit seems yellow as it absorbs all light colours fall on it and reflects the yellow colour only.



G.R.

• A banana fruit seems yellow when sunlight falls on it.

Because the banana fruit absorbs all light colours and reflects the yellow colour only.



Question

Complete the following:

1. .... and .... objects absorb all light colours that fall on them and permit .... only to pass through them.
2. .... objects reflect all light colours, while .... objects absorb all the light colours falling on them.
3. .... object absorbs all light colours that fall on it and reflects its own colour only.

Answer

1. Transparent - translucent - its own colour
2. White opaque - black opaque
3. The coloured opaque



Try to answer Test yourself 3

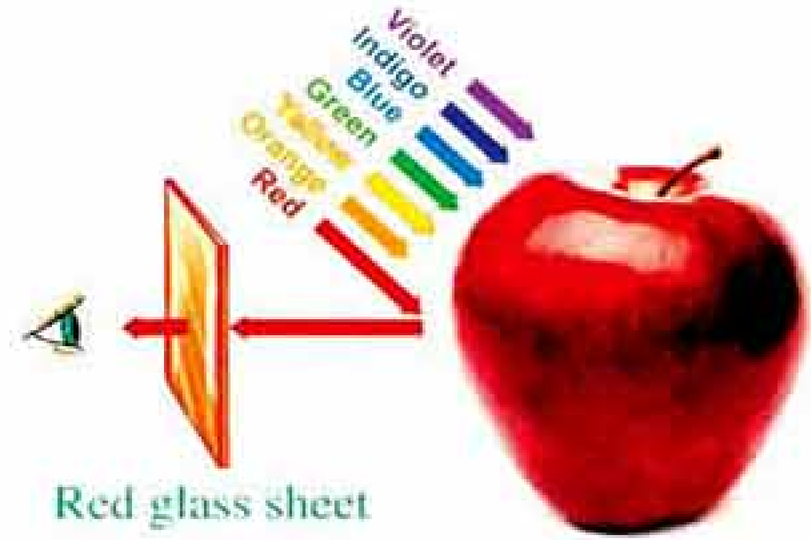
2
Lesson

Third Seeing the coloured opaque object through coloured transparent objects

Activity 2 To know how you can see the coloured opaque objects through coloured transparent objects.

Step:

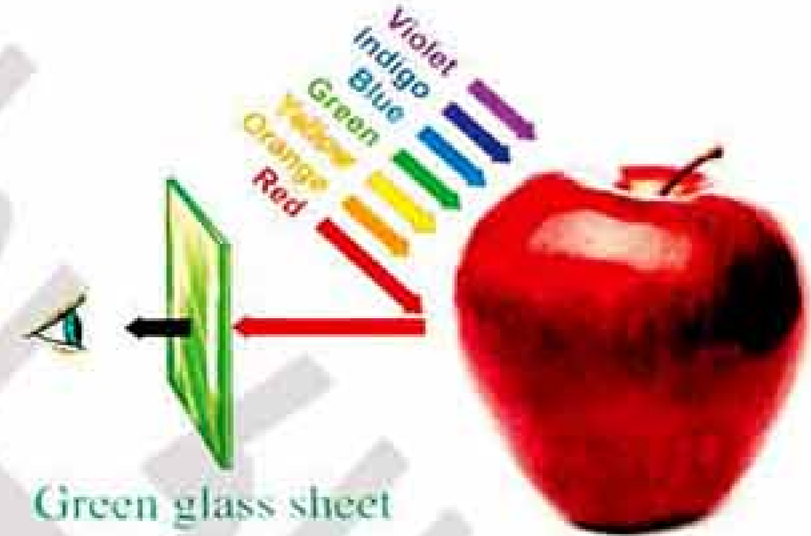
Look at a red apple through:
- a red transparent glass sheet.
- a green or blue transparent glass sheet.



Red glass sheet

Observations:

- The apple appears red when you look at it through the red transparent glass sheet.
- The apple appears in no colour (black) when you look at it through the green or blue transparent glass sheet.



Green glass sheet

Explanation:

- The apple appears red through the red transparent glass sheet, because:
  - The apple absorbs all light colours that fall on it and reflects the red light only.
  - The reflected red light strikes the red transparent glass sheet and transmits through it, then reaches our eyes.
- The apple appears in no colour (black) through the green or the blue transparent glass sheet, because :
  The reflected red light from the apple is absorbed by green or blue transparent glass sheet and doesn't transmit through them.

Inference :

The opaque object is seen in its real colour when you look at it through a transparent object that has the same colour.

glass sheet لوح زجاجى | reflected light الضوء المنعكس | real colour اللون الحقيقى

Mixing the coloured lights




There are two types of coloured lights which are primary coloured lights and secondary coloured lights.

Primary coloured lights:

They are coloured lights which cannot be produced by mixing two other coloured lights.

Examples : Red , Green and Blue coloured lights.

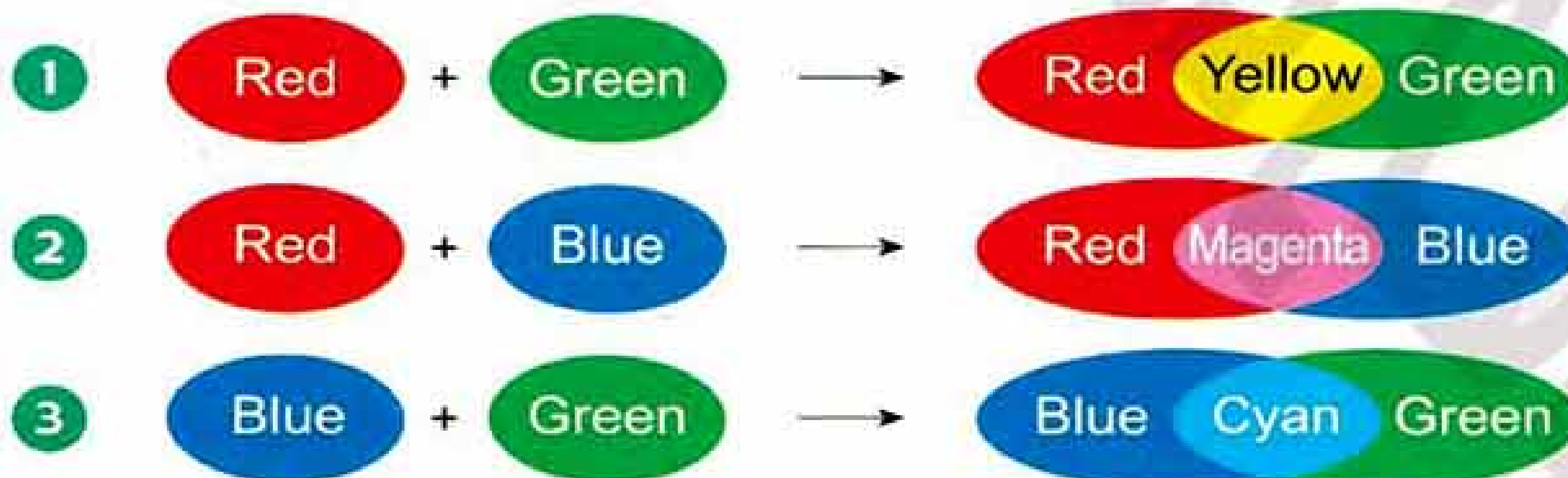
- On mixing all the primary coloured lights, white light is produced.
- On mixing any two of the primary coloured lights, a secondary coloured light is produced.



Secondary coloured lights:

They are coloured lights that are produced by mixing two of the primary coloured lights.

Examples : Yellow , Magenta and Cyan coloured lights.



NB.

We must use three coloured projector sets (red, green and blue) to study the effect of mixing the primary coloured lights.

secondary coloured lights	الأضواء الثانوية	primary coloured lights	الأضواء الأساسية
projector sets	أجهزة إسقاط ضوئية		

2 Lesson

G.R.

- **Red light is a primary coloured light.**
  Because it can't be produced by mixing any of the other coloured lights.
- **Magenta is called a secondary coloured light.**
  Because it is produced by mixing two of the primary coloured lights which are red and blue.



Question

Choose the correct answer:

1. Mixing red and green lights gives .... light.

a. yellow *b. cyan* *c. magenta* *d. red*

2. Mixing all the primary coloured lights gives ....

a. the black light. *b. the green light.*
c. the red light. *d. the white light.*

Answer

1. a. yellow *2. d. the white light.*

Do you know ?

Mixing coloured dyes gives colours that are different from those produced by mixing coloured lights.



Try to answer Test yourself 4 & 5

dyes أصباغ



Remember



- Mixing the seven spectrum light colours produces white light.
- Colours of transparent and translucent objects are the same colour of the transmitted light through them.
- When white light strikes a white opaque object, it reflects all light colours.
- Black opaque object obsorbs all the lights that fall on it and doesn't reflect any light colour.
- The colour of the coloured opaque object is the colour of the reflected light.
- The opaque object is seen in its real colour when you look at it through a transparent object that has the same colour.
- **Comparison between the primary coloured lights and secondary coloured lights.**

Points of comparison	Primary coloured lights	Secondary coloured lights
• **Definition:**	They are coloured lights which cannot be produced by mixing two other coloured lights.	They are coloured lights that are produced by mixing two of the primary coloured lights.
• **Examples:**	Red , green and blue.	Yellow , magenta and cyan.

Questions on lesson two



Questions signed by 📖 have been taken from the school book.

1. Choose the correct answer:

1. When sunlight strikes a red transparent glass sheet, the sheet appears ....
   a. yellow. b. black. c. red. d. white.
2. The green glass bottle .... when white light falls on it.
   a. reflects all light colours
   b. absorbs all light colours and allows the green colour only to pass through
   c. absorbs all light colours
   d. reflects green colour only
3. When white light falls on an orange translucent box , ...
   a. the box absorbs all light colours and appears black.
   b. the box absorbs all light colours and allows the orange colour only to pass through.
   c. the box reflects the orange colour.
   d. the box absorbs the orange colour and allows all light colours to pass through.
4. The transparent and translucent objects have the same colour of ....
   a. the absorbed light colour. b. the transmitted light colour
   c. the reflected light colour. d. the spectrum light colours.
5. When white light strikes a blue dress , the dress appears ....
   a. yellow. b. green. c. blue. d. orange.
6. The white clothes appear white when white light falls on them , because ....
   a. they absorb all light colours.
   b. they reflect all light colours.
   c. they absorb all light colours except white colour.
   d. they allow light colour to transmit through.

7. We wear white clothes in summer season to ....
   a. reflect all light colours.
   b. absorb all light colours.
   c. refract all light colours.
   d. absorb all light colours except the red colour.
8. The blackboard .... when white light falls on it.
   a. absorbs all light colours
   b. reflects all light colours
   c. refracts all light colours
   d. absorbs all light colours except red
9. Banana fruit seems yellow in colour , because ....
   a. it reflects all light colours.
   b. it absorbs the yellow colour and reflects all other light colours.
   c. it absorbs all light colours and reflects the yellow colour only.
   d. it absorbs all light colours and allows the yellow colour to pass through.
10. The coloured opaque objects .... when the white light strikes them.
   a. absorb all light colours and reflect their own colour only
   b. reflect all light colours and absorb their own colour
   c. absorb all light colours
   d. reflect all light colours
11. An orange appears .... when you look at it through a blue transparent glass sheet.
   a. red b. yellow c. green d. black
12. The following coloured lights are primary lights except ....
   a. yellow. b. green. c. red. d. blue.
13. Which of the following is considered as a secondary colour ? ....
   a. Cyan. b. Green. c. Blue. d. Red.
14. Mixing green and blue lights gives .... light.
   a. yellow b. cyan c. magenta d. red
15. Mixing all the primary coloured lights gives the ....
   a. black light. b. green light. c. red light. d. white light.

2
Lesson

16. Which of the primary coloured lights are mixed to produce yellow colour ? ....

a. Red and green.
b. Red and blue.
c. Blue and green.
d. Blue and cyan.

2. Put (✓) in front of the correct statement and (×) in front of the incorrect one, then correct it:

1. The transparent objects have the same colour of the light that transmits through them. ( )
2. When the white light strikes a red rose , the rose reflects the white colour. ( )
3. We see the coloured transparent body with the same colour, because it reflects all light colours. ( )
4. An object seems white as it reflects all light colours. ( )
5. The black T-shirt reflects all light colours fall on it. ( )
6. If you look at a yellow banana through a green glass sheet , it seems black. ( )
7. The black opaque objects absorb all light colours and reflect their own colour only. ( )
8. The green table reflects all light colours. ( )
9. Blue, green and red lights are primary coloured lights. ( )
10. Seeing a red jacket through a glass sheet means that the colour of the sheet is green. ( )
11. When you look at a black body through a glass plate, the body and the plate seem with the same colour. ( )
12. Mixing blue light with green light gives the white light. ( )
13. Yellow , magenta and cyan are primary coloured lights. ( )
14. Mixing red light with green light gives yellow light. ( )
15. One of the primary coloured lights is produced by mixing red light with blue light. ( )

3. Write the scientific term of each of the following:

1. A light results from mixing seven spectrum colours. (..................)
2. The object that absorbs all light colours and allows its own colour only to pass through. (..................)

3. The lights that cannot be produced by mixing two other coloured lights. (..............)
4. The objects that reflect all light colours that fall on them. (..............)
5. The objects that absorb all light colours that fall on them. (..............)
6. The object that absorbs all light colours and reflects its own colour only. (..............)
7. Objects that can be seen in the colour of their reflected lights. (..............)
8. The light that we can get by mixing two of the primary coloured lights. (..............)
9. A light that is resulted from mixing red , blue and green coloured lights. (..............)
10. The coloured light that is produced by mixing red and blue lights. (..............)
11. The coloured light that is produced by mixing blue and green lights. (..............)
12. Coloured lights that are mixed together to produce cyan light. (..............)

4. Complete the following statements:

1. The prism separates the sunlight into ....
2. On mixing all of the seven spectrum colours, the .... is produced.
3. When the white light strikes a transparent blue object , this object absorbs .... and allows .... only to pass through.
4. .... objects have the same colour of light which transmitted through.
5. When a white light strikes a transparent glass sheet, the glass sheet doesn't allow to pass any of light colours and permits .... to pass through.
6. When a white light falls on a yellow translucent plate , the plate absorbs all the light colours except ....
7. The only light colour which passes through a transparent violet body is .... light.
8. All light colours are .... when they fall on a white opaque body.
9. The white board .... all light colours , while the blackboard .... all light colours.

2 Lesson

10. 📖 .... objects seem having the same colour of light that they reflect.
11. The strawberry fruit seems red, because it reflects the .... colour only.
12. The coloured .... object reflects its own colour only, while the coloured .... or .... object allows its own colour only to pass through.
13. .... object absorbs all light colours, while .... object absorbs all light colours and reflects its own colour only.
14. The red apple appears .... when you look at it from a transparent red glass sheet and appears .... when you look at it through a transparent green glass sheet.
15. As the light falls on the green grass, the grass must absorb .... colours except ....
16. 📖 If the red light strikes a white ball , the ball looks in .... colour.
17. 📖 Red light + Green light + Blue light = ...
18. .... , ... and .... are the primary coloured lights.
19. .... are coloured lights which cannot be produced by mixing two other coloured lights.
20. Mixing all the primary coloured lights together gives ....
21. .... , ... and .... are called secondary coloured lights.
22. .... are produced by mixing two of the primary coloured lights.
23. Mixing .... and .... lights gives yellow light.
24. Mixing green and blue lights gives ....
25. Mixing .... and .... lights produces magenta light.

5. Give reasons for the following:

1. The green glass window seems green when a white light strikes it.

....

....

2. The transparent and semi-transparent bodies appear coloured with the light that passes through them.

....

....

3. A banana fruit seems yellow when sunlight falls on it.

....

....

4. We must wear white clothes in summer season.

....

5. The red transparent ruler appears red when white light falls on it.

....

6. When sunlight falls on a white paper, it appears white.

....

....

7. It is preferred to wear black clothes in winter.

....

....

8. If a white light strikes a transparent blue glass sheet , the blue light only passes through it.

....

....

9. The red apple seems black when you look at it through a green glass sheet.

....

....

10. Red , green and blue are called primary coloured lights.

....

11. Yellow, magenta and cyan are called secondary coloured lights.

....

12. The chalk appears white, while the board appears black.

....

....

13. Magenta is a secondary coloured light.

....

....

6. What happens when ...?

1. Mixing the seven spectrum colours.

....

2. Green light strikes a black object.

....

3. White light strikes a red apple.

....

4. White light strikes a transparent yellow bottle.

....

5. You look at a green apple through a red glass sheet.

....

6. Mixing green and blue lights.

....

7. White light falls on a white ball.

....

8. White light falls on a banana fruit.

....

9. Mixing red light with blue light.

....

10. Mixing red light with green light.

....

7. What is meant by ...?

1. Primary coloured lights.

....

2. Secondary coloured lights.

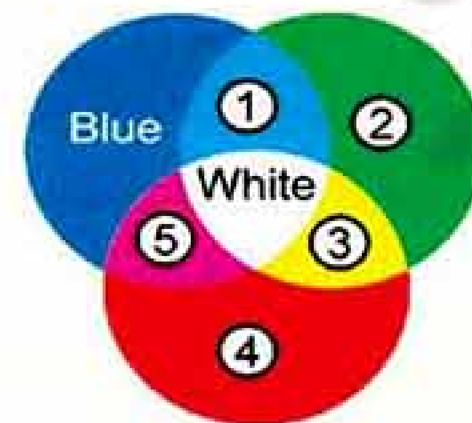
....

8. Compare between primary and secondary coloured lights.

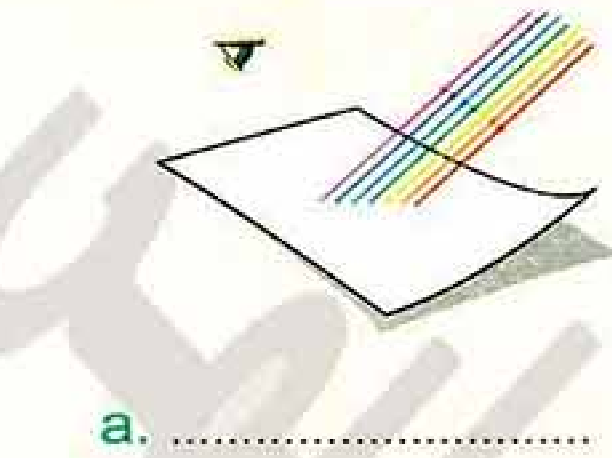
....
....
....

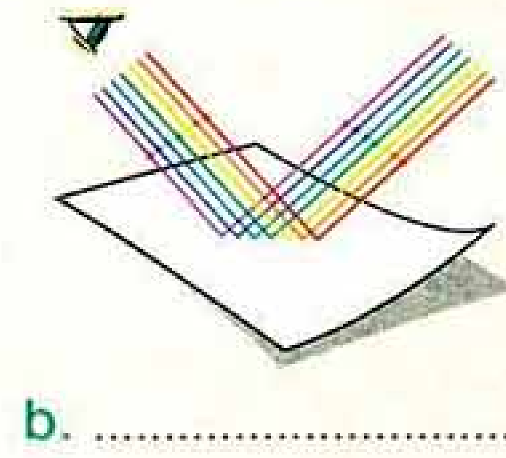
9. Complete the following figure and mention the type of each colour:

① ....
② ....
③ ....
④ ....
⑤ ....

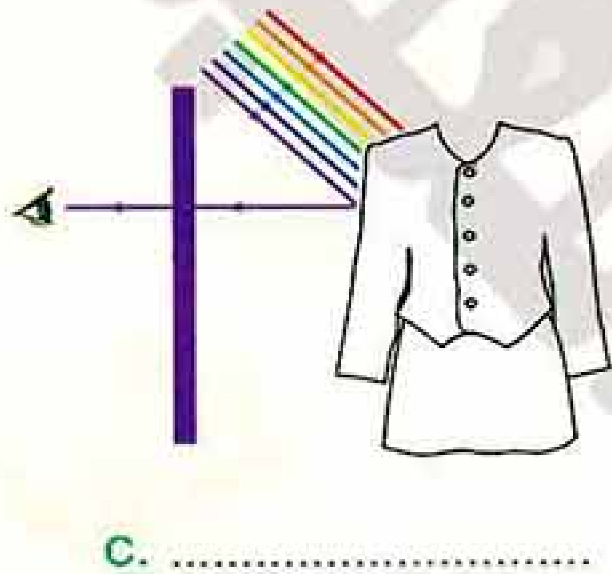


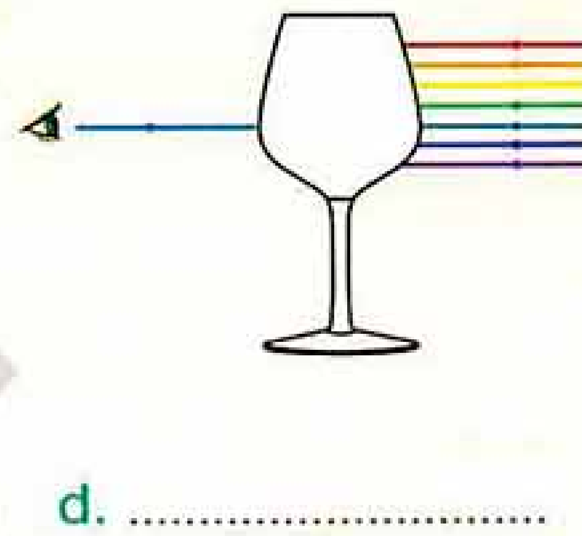
10. What is the colour of the body in each case ?





a. .... b. ....





c. .... d. ....

11. Complete the following table:

The colour of object	The colour of falling light	The colour of object after falling light	Reason
1. Black.	White	....	....
2. Green opaque.	White	....	....
3.	White	Yellow	....
4. Black.	Red	....	....
5. Transparent orange.	White	....	....

Timss Questions



1. The following table shows what happens when different coloured lights try to pass through a coloured filter. Complete the missing parts.

Colour of light	Colour of filter	Colour of light that passes through the filter
a. Blue. b. Green.	- Transparent red - Transparent green	....

2. We know that when white light falls on a blue object, the blue light colour is reflected.

What happens when the blue light colour falls on a yellow T-shirt ?



....

3. Nermeen puts on a pair of glasses, one of its filters is yellow and the other is red.

Complete :



a. When she looks at a red apple through the yellow filter, she finds that its colour is ....

b. When she looks at the apple through red filter, she finds that its colour is ....

4. According to your study to this lesson, what is the advice that you say to your friends about the clothes that they wear in summer and winter seasons ?

....

....



Lesson 3 Magnetism

- What is magnetism ?
Magnetism is the ability of the magnet to attract magnetic materials.

In this lesson, we will study

- History of discovering magnet
- Types of magnet
- Properties of magnet
- Uses of magnet

History of the discovery of magnet

- 2000 years ago, the ancient Greeks found a type of black rocks located in an area named "Magnesia".
- This type of rocks has an attraction force to any material made of iron.



SO, scientists called this black rock "natural magnet" and its attraction force "magnetism".

magnetism	المغناطيسية	properties	صفات	types	أنواع	ancient Greeks	اليونانيون القدماء
discovering	إكتشاف	history	تاريخ	magnet	مغناطيس	natural	طبيعي

3
Lesson

Types of magnet

Magnets are classified into two types :

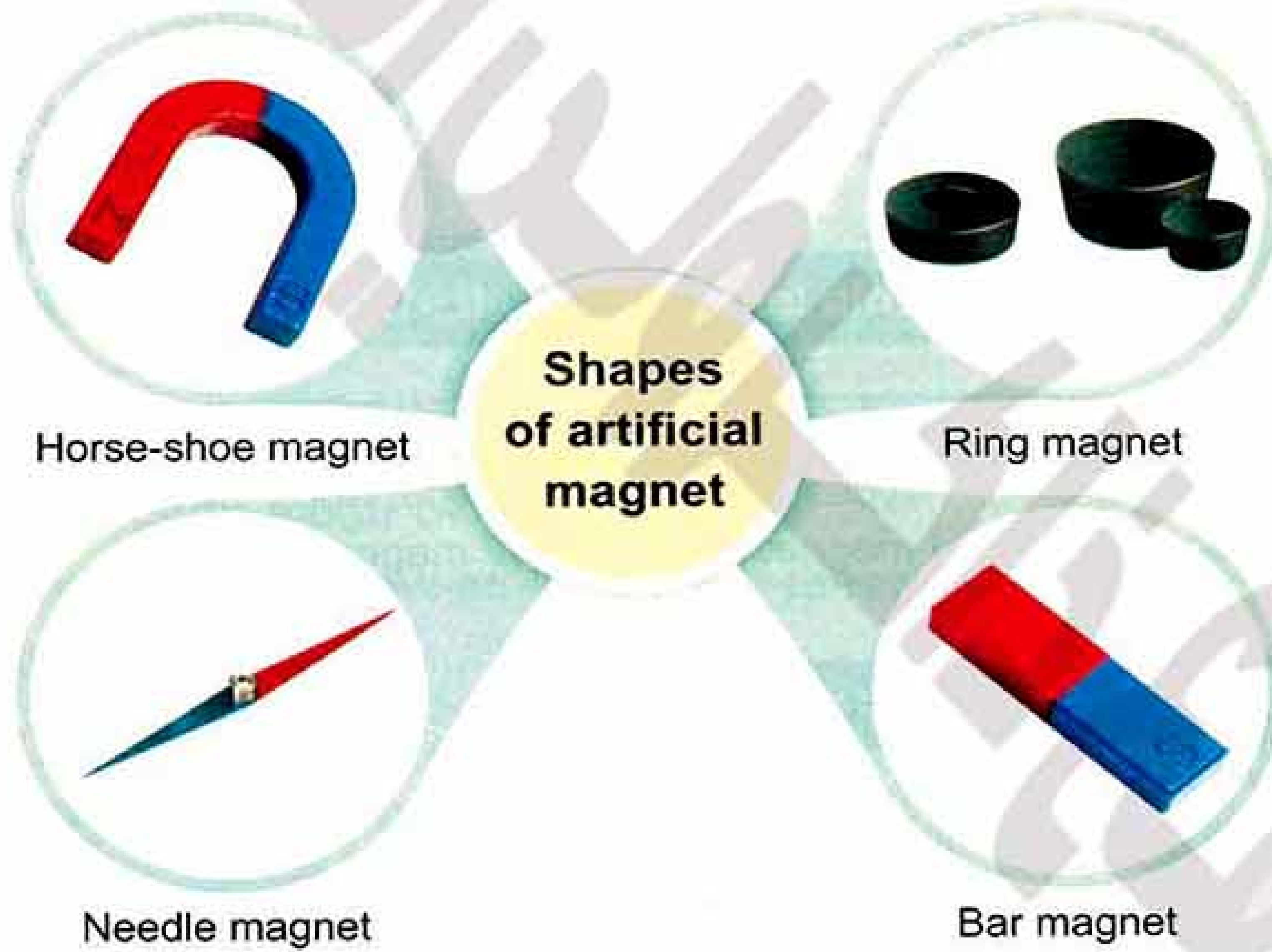
1 Natural magnet

- It is a black rock.
- It is one of the iron ores which is known as "Magnetite".



2 Artificial magnet

- It is a magnet made by man.
- It has different shapes and sizes.



Exercise

Complete the following sentences:

1. *Natural magnet is one of.................. ores known as ....*
2. *Artificial magnet has many shapes such as ring magnet, ... , ... and ....*

iron ore	خام الحديد	bar	قضيب	artificial	صناعى
horse-shoe	حدوة حصان	needle	إبرة		

But, the magnet attracts some materials and doesn't attract the others.

SO, materials are divided into two types according to the ability to be attracted :

A Magnetic materials

They are the materials which are attracted to the magnet.

Examples:
Iron, nickel, steel and cobalt.

B Non-magnetic materials

They are the materials which are not attracted to the magnet.

Examples:
Chalk, glass, paper, aluminium, copper, wood, leather and plastic.

Activity 1

To prove that magnetic materials are attracted to the magnet, while non-magnetic materials are not.

Tools:

Pins – iron nails – a piece of glass – a piece of chalk – paper clips – aluminium spoon – copper wire.



Step:

Put the previous samples on a table, then approach a magnet to each sample.

Observations:

- Pins, iron nails and paper clips are attracted to the magnet.
- Chalk, glass , spoon and copper wire are not attracted to the magnet.

Inference :

Materials that are attracted to the magnet are called magnetic materials and those are not attracted to the magnet are called non-magnetic materials.

magnetic materials	مواد مغناطيسية	non-magnetic materials	مواد غير مغناطيسية
approach	يقرب	samples	عينات

3 Lesson

G.R.

The magnet attracts metallic paper clips, but doesn't attract copper wire.

Because paper clips are magnetic materials, but copper wire is a non-magnetic material.

Do you know ?

The magnet is used in making the doors of refregirators and the small toys sticking on them.



Properties of magnet

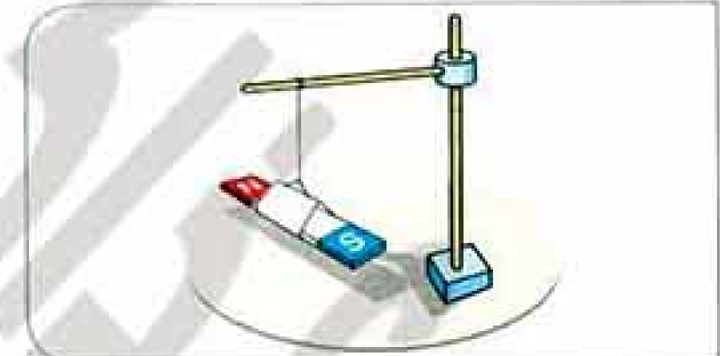




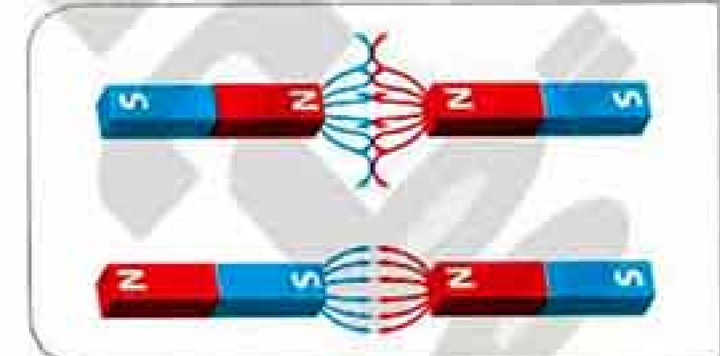
1. The magnet has two poles.



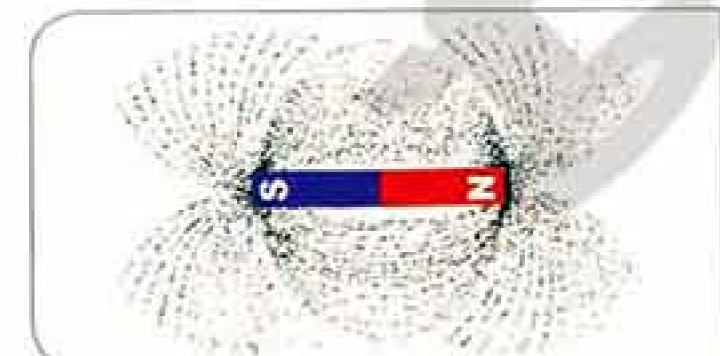
2. The freely moving (suspended) magnet always takes a fixed direction, which is north-south direction.



3. The like (similar) magnetic poles repel each other, but the dislike (opposite) magnetic poles attract each other.



4. The magnet is surrounded by an area called "magnetic field".

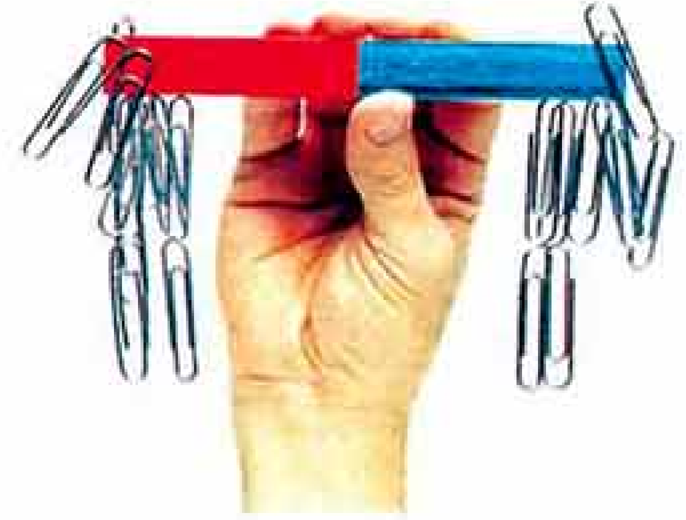


doors of refregirators	أبواب الثلاجات	repel	تتنافر	north	شمال
sticking	اللاصقة	magnetic field	المجال المغناطيسى	freely suspended	معلق حرًا
direction	إتجاه	poles	أقطاب	south	جنوب

1 The magnet has two poles

Activity 2

- **To show that the magnet has two poles.**
- **To discover the regions (areas) of the magnet which have the most attraction force.**



Step:

Approach a bar magnet to the metallic paper clips as shown in the figure.

Observation:

The greatest number of the metallic paper clips is attracted to the two ends of the magnet, then it decreases gradually until it disappears at the middle of the magnet.

Inference :

The regions of the magnet which have the most attraction force are the two ends which are called "two poles of magnet".

Two poles of magnet (magnetic poles):

The areas (regions) of magnet which have the most powerful force of attraction.

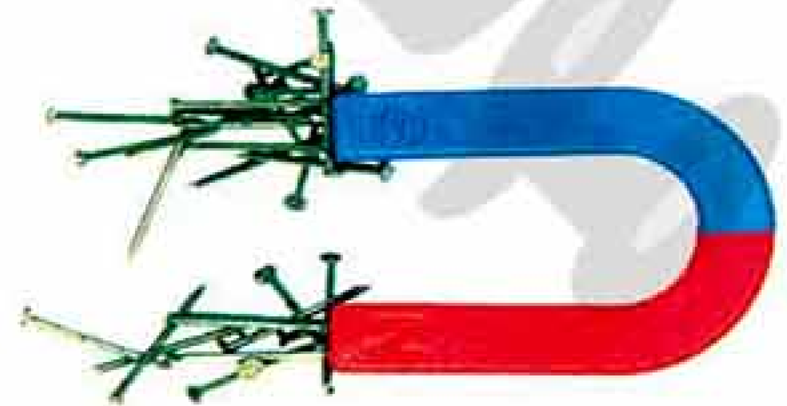
Or

The areas of magnet at which most of the attraction force (magnetism) is concentrated.

G.R.

When you approach a magnet to some iron nails, the most of them are attracted to the two poles of the magnet.

Because the attraction force of the magnet is concentrated at the two poles of the magnet.

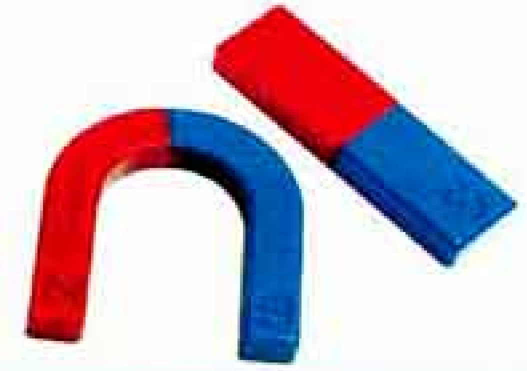


gradually	تدريجياً	regions	مناطق	concentrated	مُركزة
disappear	تختفى	middle	منتصف		

3
Lesson



Note

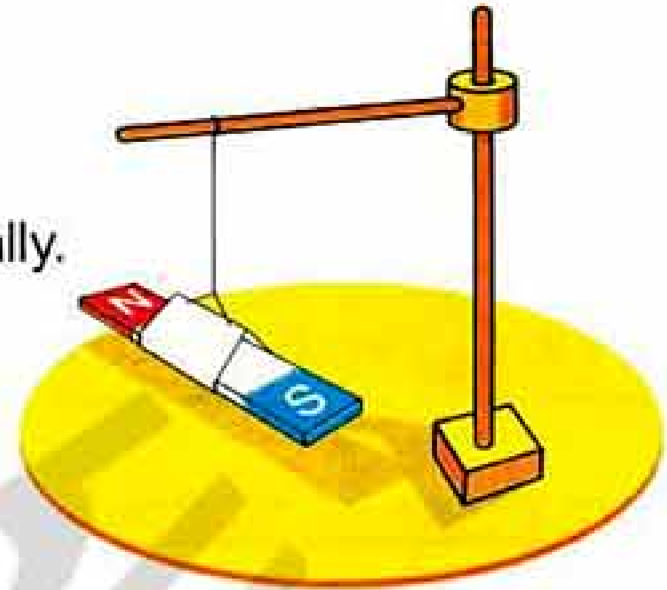


To differentiate between the two poles of magnet, the north pole is often red-coloured, but the south pole is often blue-coloured.

2 The freely suspended magnet always takes a fixed direction

Activity 3 **To prove that the freely moving (suspended) magnet always takes a fixed (north-south) direction.**

Steps:



1. Suspend a bar magnet from its centre with a thread fixed to a wooden stand.
2. Leave the magnet until it stabilizes (settles) horizontally.
3. Move the magnet to the right side or left side slightly, then leave it to stabilize again.
4. Repeat the previous step for several times.

Observation:

One pole of the magnet tries to search for the north direction of the Earth, while the other pole tries to search for the south direction of the Earth.

Inferences :

1. The freely suspended magnet always takes a fixed direction which is "north-south" direction.
2. The pole of magnet which points to the north direction is called "north pole (N)", but the pole of magnet which points to the south direction is called "south pole (S)".



Try to answer Test yourself 6

differentiate	يُميز	stabilizes / settles	يستقر	horizontally	أفقياً
fixed	ثابت	slightly	قليلًا	thread	خيط

3 The like magnetic poles repel each other, but the dislike magnetic poles attract each other

Activity 4 To prove that like (similar) magnetic poles repel, but dislike (opposite) magnetic poles attract.

Steps	Figures	Observations
1. Hang a magnet with a thread and leave it to settle, then approach the north pole of another magnet to the north pole of the hung one as in fig.(a).	N N S Fig. (a)	- The two north poles repel each other.
2. Approach the south pole of the magnet to the south pole of the hung one as in fig.(b).	S S N Fig. (b)	- The two south poles repel each other.
3. Approach the north pole of the magnet to the south pole of the hung one as in fig.(c).	N N S Fig. (c)	- The north pole attracts the south pole.

Inference :
The similar (like) magnetic poles repel each other,
but the opposite (dislike) magnetic poles attract each other.

hung علّق

3 Lesson

G.R.

The north pole of a magnet attracts the south pole of another magnet, but repels the north pole.

Because the opposite magnetic poles attract each other, while the similar magnetic poles repel each other.



Question

Who am I ?

1. *I'm one of the iron ores and my colour is black.* (.................)
2. *We are regions of magnet, where most of the magnetic materials are attracted.* (.................)
3. *I'm a fixed direction, where the freely suspended magnet takes.* (.................)

Answer

1. *Natural magnet.*
2. *Two magnetic poles.*
3. *North-south direction.*

4 The magnet is surrounded by an area called "magnetic field"

Magnetic field:

It is the space around the magnet in which the effect of magnetic force appears.

Magnetic force:

It is the ability of the magnet to attract the magnetic materials existed in its field.

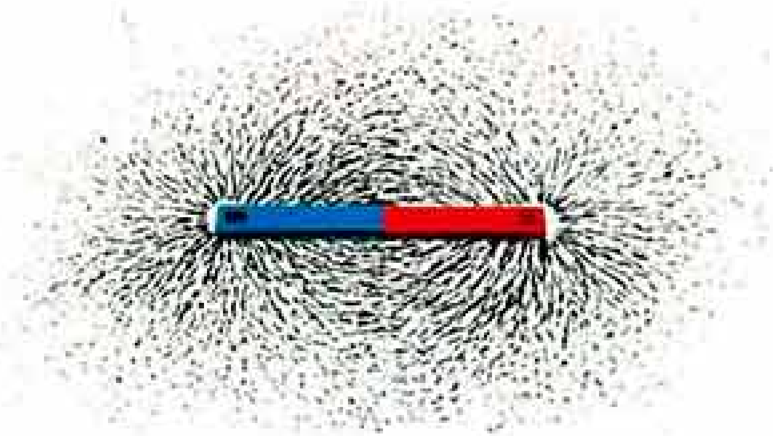
- The magnetic force is an **invisible force**.

SO, we use iron filings to see the magnetic field that is formed by the effect of magnetic force.

iron filings برادة حديد magnetic force القوة المغناطيسية



Activity 5 To illustrate the magnetic field of a magnet by using iron filings.



The magnetic field of a magnet by using iron filings

Steps:

1. Put a bar magnet horizontally on a table, then put a glass sheet on it.
2. Sprinkle some iron filings on the glass sheet, then knock on it slightly.

Observations:

- Iron filings are arranged around the magnet in a regular way.
- The biggest amount of iron filings are assembled at the two poles of the magnet.



Inferences :

- The magnetic field around the magnet takes a regular shape.
- The greatest magnetic force of the magnet is concentrated **at the two poles** of magnet.

Question

Complete the following sentences:

1. The similar magnetic poles .... , while the opposite magnetic poles ....

2. .... is the ability of magnet to attract the magnetic materials existed in its field.

3. .... is the space around the magnet in which the effect of magnetic force appears.

Answer

1. repel - attract. *2. Magnetic force* *3. Magnetic field*

existed	الموجودة	illustrate	يوضح	assembled	يتجمع
sprinkle	ينثر / يُرش				



3
Lesson

Uses of magnet

Making "the magnetic compass" is one of the uses of magnet in our daily life.

The magnetic compass

Historical background:

- Long time ago, the Chinese used the magnetic rock that spins freely taking a fixed direction which is north-south direction.

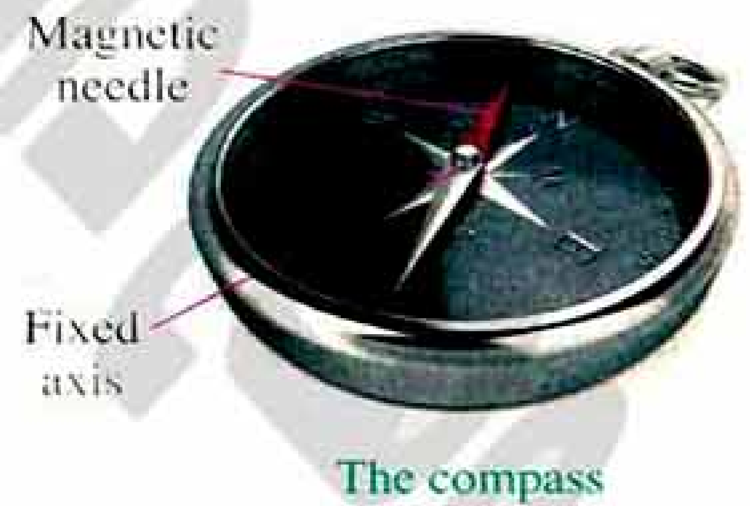
- A Chinese major general depends on this idea in leading his army through dense foggy areas.

- In 1600, the English scientist "William Gelbert" took the idea of magnetic rock and made a small magnetized needle, that is light for spinning freely.

- This magnetized needle was the basic idea in making the compass.

Its structure: *It consists of:*

A light and small magnet (magnetic needle) that can spin freely around a fixed axis.
Where,
the north pole of this magnetic needle refers to the north direction of the Earth and its south pole refers to the south direction of the Earth.



The compass

Its importance:

It is used to identify the main four geographical directions.

How can you make a model of compass ?

The answer of this question is in the following activity.

identify	يحدد	magnetic compass	البوصلة المغناطيسية	major general	قائد عسكرى
Chinese	الصينيون	spins	يدور	magnetized needle	أبرة ممغنطة
army	جيش	dense foggy	كثيفة الضباب	fixed axis	محور ثابت
geographical	جغرافى	historical background	خلفية تاريخية		

Activity 6 To know how you can make a model of compass.



Tools:

A basin containing water - a piece of cork - a magnetized needle.

Steps:

1. Pass the magnetized needle through the piece of cork, then put it in the basin containing water.
2. Move the piece of cork, then leave it to stabilize.

Observation:

The piece of cork with the magnetized needle moves (floats) freely, then stabilizes taking the north-south direction.

Inference :

The compass is a needle magnet that takes a fixed direction which is north-south direction.

G.R.

The compass is used to locate (determine) the main four directions.

Because its magnetic needle always points to the north and south directions of the Earth.





Try to answer Test yourself **7** & **8**

cork	فلين	basin	حوض
float	يطفو	locate/determine	يُحدد

Remember



- **Types of magnet are:**
  1. Natural magnet: It is a black rock and it is one of iron ores called magnetite.
  2. Artificial magnet: It is made by man and has many different shapes and sizes
- **Magnetic materials:** Are the materials which are attracted to the magnet, such as iron, steel, nickel and cobalt.
- **Non-magnetic materials:** Are the materials which are not attracted to the magnet, such as glass, plastic, wood ... etc.
- **The magnet has two poles:**
  - North pole which always points to the north geographical direction.
  - South pole which always points to the south geographical direction.
- Like magnetic poles repel each other, while dislike magnetic poles attract each other.
- **Two magnetic poles:** They are areas of magnet which have the most powerful force of attraction.
- **Magnetic field:** It is the space around the magnet in which the effect of magnetic force appears.
- **Magnetic force:** It is the ability of the magnet to attract the magnetic materials existed in its field.
- The compass consists of a light and small magnetic needle that spins freely around a fixed axis.
- The compass is used to identify the main four geographical directions.

Questions on lesson three



Questions signed by 📖 have been taken from the school book.



1. Choose the correct answer:

1. The natural magnet was discovered more than .... years ago.
   a. 2000 b. 3500 c. 2050 d. 2500
2. The natural magnet is made of one of the iron ores called ....
   a. magnetite. b. magnetism. c. magnesia. d. hematite.
3. Magnets are divided into .... types.
   a. three b. two c. four d. five
4. All the following materials are attracted to the magnet except ....
   a. iron. b. nickel. c. cobalt. d. chalk.
5. All the following materials are not attracted to the magnet except ....
   a. plastic. b. paper. c. glass. d. nickel.
6. If you put a magnet near a magnetic material, it will ....
   a. repel it. b. attract it.
   c. have no effect on it. d. eat it.
7. The magnet has .... poles.
   a. no b. two c. three d. four
8. The similar magnetic poles .... each other.
   a. attract b. repel c. do not affect d. replace
9. The dislike magnetic poles .... each other.
   a. attract b. repel c. do not affect d. eat
10. The most attraction force of the magnet exists ....
    a. at its middle. b. at its two poles.
    c. near to its middle. d. at only one pole.
11. If a bar magnet attracts three paper clips near its middle, so the number of paper clips attracted at each pole is .... paper clips.
    a. less than three b. more than three
    c. less than two d. three



3
Lesson

12. When a magnet is hanged freely, its north pole is directed towards the .... direction of the Earth.
a. north b. south c. east d. west

13. When the magnet is hanged freely, it will take .... direction.
a. north-west b. north-east c. north-south d. east-south

14. If you put the north pole of a magnet near the south pole of another magnet, they ....
a. repel. b. attract. c. have no effect. d. (a) , (b) and (c).

15. If you put the north pole of a magnet near the north pole of another magnet, they ....
a. repel b. attract. c. have no effect. d. colour each other.

16. The area that is around the magnet, where its magnetic properties appear is called a ....
a. magnetic pole.
b. magnetic substance.
c. non-magnetic substance.
d. magnetic field

17. .... is the ability of the magnet to attract the magnetic materials existed in its field.
a. Magnetic field
b. Natural magnet
c. Magnetic force
d. Magnetic material

18. The magnetic force of a magnet disappears at ....
a. its two poles.
b. the south pole of the magnet.
c. the north pole of the magnet.
d. its middle.

19. The compass contains a ....
a. horse-shoe magnet.
b. bar magnet.
c. small and light magnetic needle.
d. ring magnet.

20. The compass is used to locate the ....
a. temperature.
b. main four directions.
c. magnetism.
d. (a),(b) and (c).

21. The needle magnet of a compass always settles at the .... direction.
a. north-east
b. east-west
c. north-south
d. west-south

2. Choose from column (B) what suits it in column (A):

(1)

(A)	(B)
1. Plastic	a. is the pole which always refers to the geographical south direction of the Earth.
2. Steel	b. is a magnetic material.
3. Compass	c. is the area surrounding the magnet, where the magnetic force appears.
4. The south pole	d. is a non-magnetic material.
5. Magnetic field	e. is a device used to identify the main four geographical directions.

1. .... 2. .... 3. .... 4. .... 5. ....

(2)

(A)	(B)
1. Natural magnet	a. has many shapes.
2. Magnetic substances	b. attract most of the iron filings.
3. Non-magnetic substances	c. is a black rock.
4. Artificial magnet	d. are attracted to the magnet.
5. Two poles of magnet	e. are not attracted to the magnet.
	f. used in making the compass.

1. .... 2. .... 3. .... 4. .... 5. ....

3. Put (✓) in front of the correct statement and (×) in front of the incorrect one, then correct it :

1. 📖 The natural magnet is one of the iron ores which is known as magnetite. ( )
2. 📖 A magnet attracts all materials. ( )
3. Materials that are attracted to the magnet are called non-magnetic materials. ( )
4. Iron, cobalt and nickel are magnetic materials. ( )
5. Glass, nickel and wood are non-magnetic materials. ( )
6. Aluminium is attracted to the magnet. ( )
7. A magnet has three poles. ( )
8. 📖 Like magnetic poles repel each other, but dislike magnetic poles attract each other. ( )

3
Lesson

9. The freely suspended magnet always takes a fixed direction. ( )
10. The regions of the magnet that attract most of the iron filings are called the magnetic substances. ( )
11. Magnetism decreases as we go from two poles of magnet towards its middle. ( )
12. 📖 The magnetic field is the space surrounding the magnet, where the magnetic force appears. ( )
13. We can see the shape of the magnetic field of a magnet by using iron filings. ( )
14. One of the applications of using a magnet in our daily life is the compass. ( )
15. The magnetic field is used to identify the main four geographical directions. ( )
16. The south pole of a compass always points to the east direction of the Earth. ( )
17. The magnetic field is the ability of a magnet to attract the magnetic materials existed in its field. ( )
18. The greatest magnetic force of the magnet is concentrated at its middle. ( )
19. The magnetic force is a visible force. ( )

4. Write the scientific term of each of the following statements:

1. A black rock of iron ores known as magnetite. (..............)
2. 📖 The materials that are attracted to the magnet. (..............)
3. 📖 The materials that are not attracted to the magnet. (..............)
4. 📖 The regions (two ends) of the magnet, where the magnetic force is most powerful. (..............)
5. The pole of the magnet which points to the north direction of the Earth. (..............)
6. The pole of the magnet which points to the south direction of the Earth. (..............)
7. 📖 The space around a magnet in which the magnetic force appears. (..............)
8. The pole of the magnet that attracts with the north pole of another magnet. (..............)

9. The ability of a magnet to attract the magnetic materials existed in its field. (............)
10. 📖 A set that is used for locating the main four geographical directions. (............)
11. An object that consists of a small and light magnetic needle that can spin freely around a fixed axis. (............)
12. The force by which the magnet attracts some materials. (............)

5. Complete the following statements:

1. Ancient Greeks discovered black rocks in a region called .... and these rocks attract materials made of ....
2. The natural magnet is a .... coloured rock.
3. The two types of magnet are .... and ....
4. The natural magnet is one of the .... ores which is known as ....
5. .... and .... are from the shapes of the artificial magnet.
6. Materials can be divided into .... and .... due to their magnetic abilities.
7. The materials that are not attracted to the magnet are called the ....
8. Iron and steel are considered from .... materials , while .... is considered from non-magnetic materials.
9. The magnet has .... poles, one of them is called .... and the other is called ....
10. 📖 The magnetic pole that always refers to the north direction of the Earth is called ....
11. 📖 The magnet has the most powerful force of attraction at its ....
12. A freely suspended magnet always takes .... direction.
13. 📖 The like poles .... each other, whereas the dislike poles .... each other.
14. The magnetic force is concentrated at .... of the magnet.
15. 📖 The .... is the space surrounding a magnet in which the magnetic force appears.
16. .... is the ability of the magnet to attract the magnetic materials existed in its field.

17. The English scientist .... made a magnetized needle which is used nowadays in making ....
18. The .... consists of a small light magnet moves freely around a fixed axis.
19. The compass is used to identify the ....
20. The sailors use .... during sailing in the ocean.
21. The compass always points to the .... and .... directions of the Earth.

6. Give reasons for the following:

1. Some materials are called magnetic materials.
   ....
2. Copper is a non-magnetic material.
   ....
3. The magnet attracts nickel, but doesn't attract aluminium.
   ....
4. Aluminium, copper and glass are considered non-magnetic materials.
   ....
5. Iron, cobalt and nickel are magnetic materials.
   ....
6. One of the poles of the magnet is called north pole, but the other is called south pole.
   ....
   ....
7. The north pole of the magnet attracts the south pole of another magnet, but repels the north pole.
   ....
   ....
8. When you approach a magnet to some paper clips, the clips are attracted to the two poles of the magnet.
   ....
9. The compass is used to locate the main four geographical directions.
   ....
   ....
10. The box of compass isn't made from iron.
   ....

7. What happens if... ?

1. A strong magnet is put close to a piece of nickel.
....
2. A strong magnet is put close to a piece of wood.
....
3. Some iron nails are put close to the middle of the magnet.
....
....
4. A magnet is immersed completely in an amount of iron filings.
....
....
5. You get a magnet close to a mixture of iron pins, cobalt, chalk and pieces of paper.
....
6. A magnet is hung to move freely.
....
7. You put the north pole of a magnet close to the north pole of another magnet.
....
8. You approach the north pole of a magnet to the south pole of another magnet.
....
9. You scatter some iron filings on a glass sheet which is put on a strong magnet, then knock on the sheet slightly.
....
....
10. Fixing a needle magnet on a piece of cork, then put it in a basin containing water.
....
....

8. In a table, classify the following materials into magnetic and non-magnetic materials:

Steel paper clips - Chalk - Cobalt - Copper - Iron filings - Plastic - Iron - Aluminium.

....
....
....

9. What is meant by...?

1. Magnetic materials.
 ....
2. Non-magnetic materials.
 ....
3. The magnetic poles.
 ....
4. Magnetic field.
 ....
5. Magnetic force.
 ....

10. What is the difference between magnetic and non-magnetic materials ? (Give examples)

....
....
....

11. What are the properties of a magnet ?

....
....
....
....

12. Look at the following figures which represent three magnets, then complete the following questions:

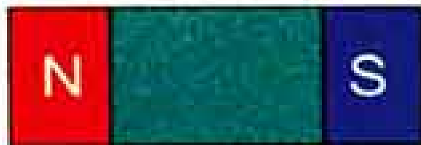


Fig. (a)



Fig. (b)

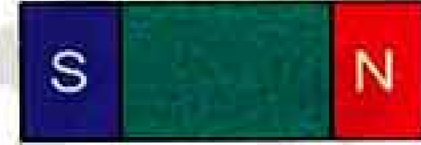


Fig. (c)

1. Magnets in figures (a) and (b), ... each other.
2. Magnets in figures (b) and (c), ... each other.
3. From the previous sentences, the .... poles repel each other, while the .... poles attract each other.

13. Look at the opposite figure, then answer:

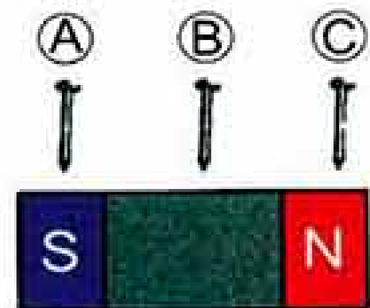


a. The opposite figure represents ....
b. This device consists of ....
c. The importance of this device is ....

Timss Questions



1. Look at the opposite figure, then answer the following questions:

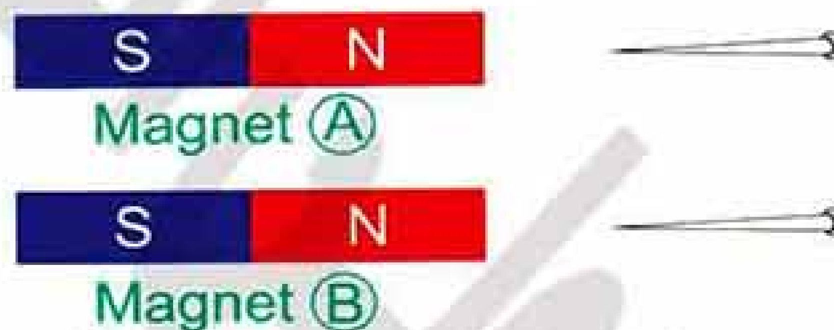


1. The pins Ⓐ and Ⓒ are .... to the magnet, because ....
2. The pin Ⓑ .... to the magnet, because ....

2. Adel has two magnets Ⓐ and Ⓑ and two metal pins that are the same.

He slides magnet Ⓐ along a table until a pin is attracted to the magnet.

He slides magnet Ⓑ along a table until a pin is attracted to the magnet.



He finds that magnet Ⓐ attracts the pin from 15 cm. and magnet Ⓑ attracts the pin from 10 cm.

Adel says that both magnets are equally strong.

(a) Do you agree ?

☐ Yes.

☐ No.

(b) Explain your answer.

....

....

3. An iron nail is more strongly attracted to the ....

a. north pole of a magnet.
b. south pole of a magnet.
c. north or south pole no difference.
d. middle of a magnet.

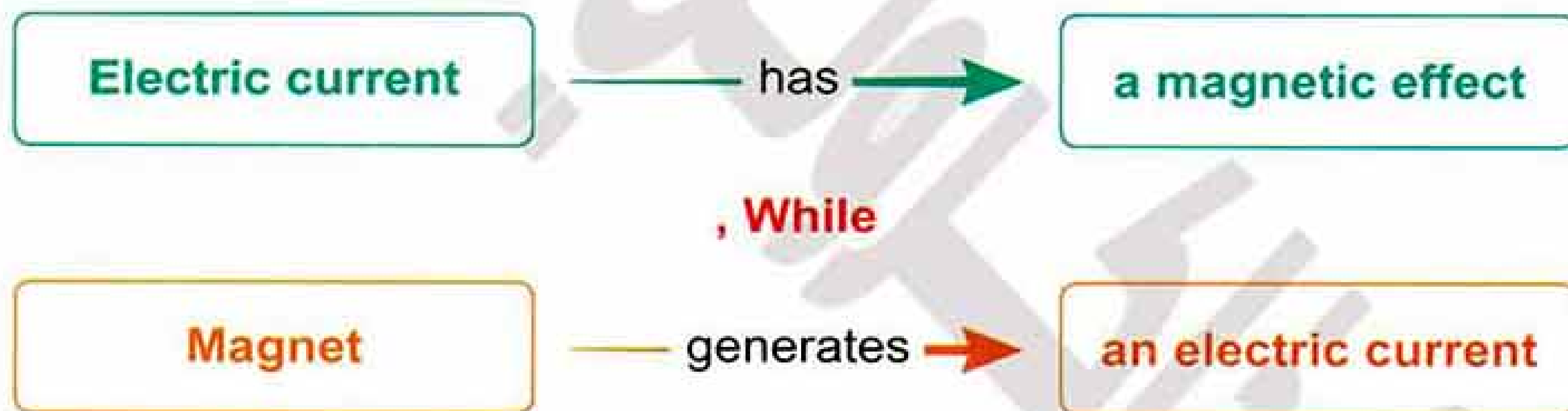
4. If magnet Ⓐ can hold three steel paper clips and magnet Ⓑ can hold five steel paper clips, which one is stronger ? ....

a. Magnet Ⓐ.
b. Magnet Ⓑ.
c. They are equally strong.
d. Magnets wouldn't attract steel paper clips.

Lesson 4

Magnetism and electricity

There is a relation between magnetism and electricity. Where,



The magnetic effect of the electric current

- The electric current can be used to generate a magnetic field.



Activity 1 **To show the magnetic effect (magnetic field) of the electric current.**

Tools:

A small compass – an insulated wire – a dry battery.

relation	علاقة	generate	يُولد	insulated	معزول
electric current	تيار كهربى	electricity	الكهرباء	dry battery	بطارية جافة
magnetic effect	تأثير مغناطيسى				

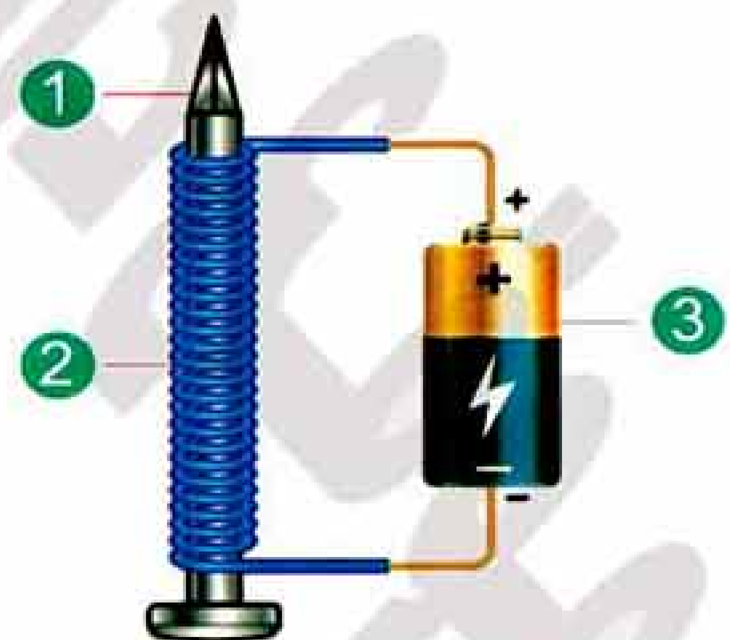
Steps	Figures	Observations
1. Put the insulated wire beside the compass which is put in four different positions (a), (b), (c), (d) as in fig. (a).	Battery (c) (d) (b) (a) Compass Insulated wire Fig. (a)	- The compass needle doesn't deflect.
2. Connect the wire ends to the two poles of the battery, then notice the compass needle in the four positions as in fig. (b).	Battery (c) (d) (b) (a) Compass Insulated wire Fig. (b)	- The compass needle deflects in the four positions after flowing the electric current through the wire.

Inference :

The electric current generates a magnetic effect (magnetic field).
Or Magnetism can be generated by electricity.

The electromagnet

It is a temporary magnet which is made by the effect of electricity.



Its structure:

1. A bar of wrought (soft) iron.
2. A twisted copper wire coiling around the bar of iron.
3. A dry cell (battery).

Its idea of working:

- When the electric current passes through the wire, the bar of the wrought iron works as a magnet.

SO,
The electromagnet converts electric energy into magnetic energy.

electromagnet	مغناطيس كهربى	coiling / twisted	مُلتف	wrought (soft) iron	الحديد المطاوع
idea of working	فكرة العمل	converts	يُحوّل	deflect	ينحرف
temporary	مؤقت				

4 Lesson

Activity 2

- To show the idea of working of the electromagnet.
- To prove that magnetism can be generated by electricity.




Tools:

30 cm. of an insulated copper wire – a long wrought (soft) iron nail – a dry battery – metal paper clips (or iron filings).

Steps	Figures	Observations
1. Approach the long wrought iron nail to the metal paper clips.	Wrought iron nail	- The iron nail doesn't attract the paper clips.
2. Wind the copper wire around the iron nail after removing the insulated material from the two ends. 3. Connect the two ends of the wire to the two poles of the battery to form an electric circuit. 4. Approach the iron nail to the paper clips.	Copper wire Wrought iron nail Paper clips Dry battery	- The iron nail attracts the paper clips.

Inference :

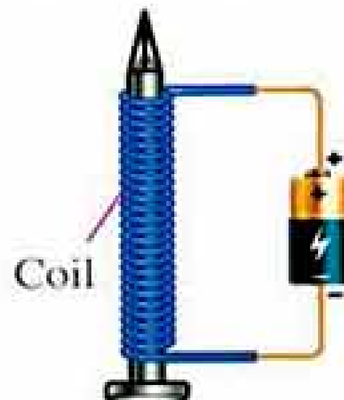
When an electric current passes through a coil winding around a wrought (soft) iron bar, the iron bar becomes a temporary magnet that is called "the electromagnet".



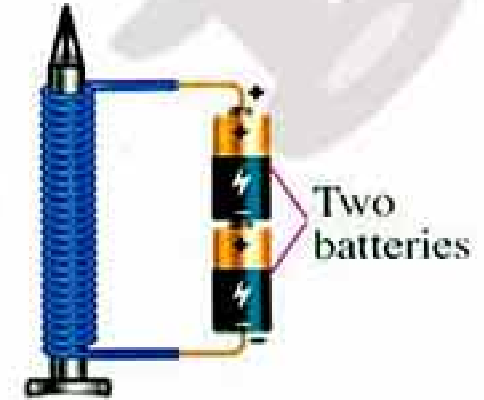
Note

The magnetic force of the electromagnet can be increased by:

a. Increasing the number of coil turns.



b. Increasing the number of batteries, where the intensity of the electric current passing through the coil increases.



coil turns لفات الملف intensity شدة

Uses of the electromagnet:

The electromagnet is used in :

1. Factories to move (lift) the heavy iron blocks as it is used for making big-sized winch (crane).



2. Making many appliances (devices) as:

a. The electric bell



b. The electric mixer



c. The disc drive



d. The television



How is the electromagnet used for moving up the heavy iron blocks ?



1 The huge electromagnet is hung in a big-sized winch.



2 The winch depresses the electromagnet over iron or steel blocks (or scrap cars) to lift them.

SO,



- By passing the electric current through the coil of the electromagnet, it will attract the iron blocks and move them to another place.



- By cutting the electric current, the electromagnet loses its magnetic force and iron or steel blocks fall.

lift	يرفع	crane	ونش	appliances / devices	أجهزة
electric bell	الجرس الكهربى	electric mixer	الخلاط الكهربى	disc drive	مُشغل أقراص الكمبيوتر
scrap cars	سيارات الخردة	huge	ضخم	depress	يُنزل/يُخفض

4 Lesson



G.R.

- **Wrought iron is used for making the electromagnet.**
  Because the wrought iron gains and loses the magnetism easily.
- **The magnetic force of the electromagnet increases by increasing the number of batteries.**
  Because the intensity of the electric current passing through the coil increases.

Question

Complete:

1. Electric current has .... effect.
2. Electromagnet converts the .... energy into .... energy.
3. The electromagnet is used in making .... , ... and ....

Answer

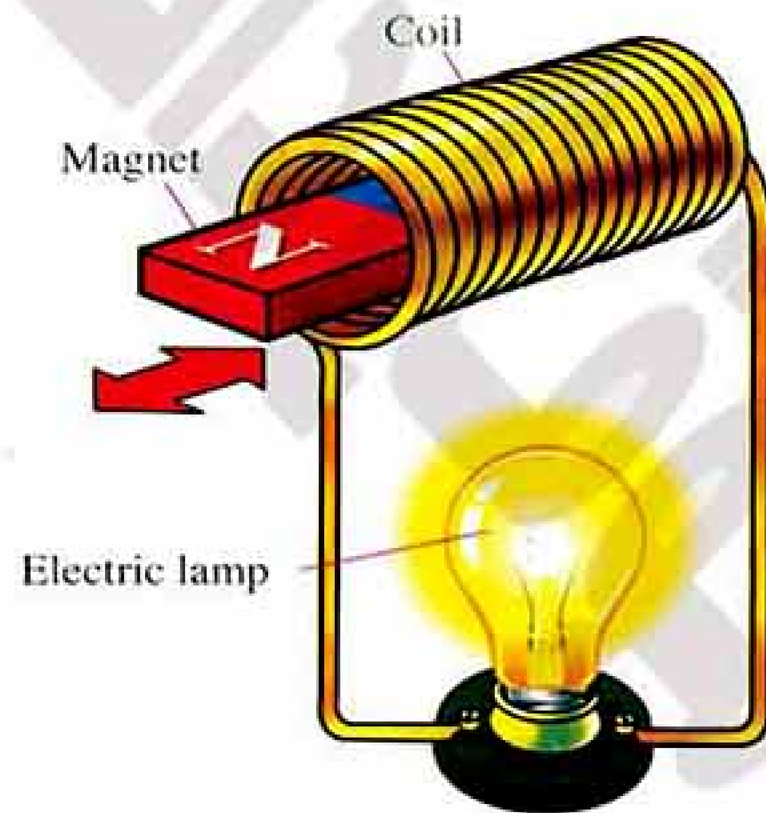
1. a magnetic
2. electric – magnetic
3. big-sized winches – electric mixer – electric bell.



Try to answer Test yourself 9

The electric effect of the magnet

- In the 19th century, the English scientist Faraday discovered that :



- When a magnet is moved inside a coil of wire, an electric current passes through the coil so, the lamp in the opposite figure lights.
- This means that the electric energy (electric current) can be generated by using a magnet.
- Faraday used this discovery to make an electric generator known as "the dynamo".

gains	يكتسب	electric generator (dynamo)	المولد الكهربى	discovery	إكتشاف



The electric generator (the dynamo)



Dynamo

Its structure:

It is made up of:

1. A copper coil.
2. A magnet.

Its idea of operation:

It converts mechanical (kinetic) energy into electric energy.

Where,

the kinetic energy moves the copper coil between the two poles of the magnet to produce electricity.

Activity 3

- **To show how the electric current (electric energy) is generated by using a magnet (magnetic energy).**
- **To know the idea of operation of the dynamo.**

Tools:

U-shaped (horse-shoe) magnet – a coil of copper wire – ammeter.

(Ammeter is a device used to measure the electric current intensity).

Steps	Figures	Observations
1. Put the copper wire (which is connected to ammeter) between the two poles of the magnet.	Magnet, N, S, Copper wire, Ammeter	- The pointer of the ammeter doesn't deflect.
2. Move the copper wire from up to down between the two poles of the magnet.	N, S	- The pointer of the ammeter deflects due to passing the electric current in the wire.
3. Increase the motion of the wire between the two poles of the magnet.	N, S	- The deflection of the pointer of the ammeter increases due to passing more electric current.

mechanical (kinetic) energy طاقة حركة pointer المؤشر current intensity شدة التيار motion حركة

4
Lesson

Inferences :

1. The electric current can be generated in a coil of dynamo by:
   a. Moving the coil in the magnetic field (between the two poles of a magnet).
   b. Moving a magnet inside the coil.
2. The generation of the electric current in the coil increases by increasing the motion of the coil between the two poles of magnet.

Examples of dynamo :




1 Small dynamo

Its structure:
- A small cylinder that touches the bicycle wheel tire.
- This cylinder is connected to a U-shaped (horse-shoe) magnet that is surrounded by a coil.

Idea of work:
It converts kinetic (mechanical) energy into electric energy.
As, when the bicycle moves, the small cylinder turns, because it touches the bicycle wheel tire, so the magnet turns inside the coil causing the lightening of the bicycle's bulb.

Uses:
It generates a small amount of electricity used to lighten the bicycle's bulb.


Small dynamo

2 Huge dynamo

Its structure:
Many great coils that turn between the two poles of a huge magnet.

Idea of work:
It converts kinetic (mechanical) energy into electric energy.

Uses:
It is used in electric power stations to generate a large amount of electricity used for lightening cities and operating factories.


Huge dynamo in electric power station

cylinder	إسطوانة	wheel	عجلة	tire	الإطار
electric power station	محطة القوى الكهربية				

The methods to increase the produced amount of electricity from the dynamo:

1. By using a strong magnet.
2. By increasing the number of turns in the moving coils.

Do you know ?

There are three types of electric power stations which are :

1. Wind electric power stations

They use wind energy to move the dynamo.

2. Thermal fuel electric power stations

They use the heat produced from burning fuel (oil, coal and natural gas) for heating water to produce steam which is used in moving the dynamo.

3. Nuclear electric power stations

They use the nuclear reactors to produce the heat required for the movement of the dynamo.

1


2


3


Try to answer :
* Test yourself 10
* General exercise of the school book on unit 1
* Model Exams on unit 1



wind	رياح	thermal fuel	الوقود الحرارى	wind energy	طاقة الرياح
coal	فحم	natural gas	غاز طبيعى	required	اللازمة
nuclear	نووية	reactors	مُفاعلات	steam	بخار

Remember



- Magnetism is always related to electricity.
- Electric current has a magnetic effect.
- Electric current can be generated by using a magnet.
- Electromagnet is made up of a copper wire twisted around a bar of wrought (soft) iron and this wire is connected to a battery.
- Electromagnet converts electric energy into magnetic energy.
- Electromagnet is used in making big-sized winch (crane), electric bell, electric mixer, disc drive and television.
- **The idea of working of electromagnet :**
  When the electric current passes through the wire, the bar of the wrought iron works as a magnet.
- **The magnetic force of the electromagnet can be increased by :**
  1. Increasing the number of coil turns.
  2. Increasing the number of batteries.
- Electric generator (dynamo) is made up of a copper coil and a magnet.
- Electric generator converts mechanical (kinetic) energy into electric energy.
- **The examples of dynamo are:**
  1. Small dynamo that is used to lighten the bicycle's bulb.
  2. Huge dynamo that is used in electric power stations to lighten cities and operate factories.
- **The amount of electricity that is produced from the dynamo can be increased by :**
  1. Using a strong magnet.
  2. Increasing the number of turns in the moving coils.

Questions on lesson four

Questions signed by 📖 have been taken from the school book.



1. Choose the correct answer :

1. When the compass is put beside a wire carrying an electric current ....
   a. no deflection occurs.
   b. the compass needle deflects.
   c. the compass needle will be destroyed.
   d. no correct answer.
2. The magnet which is made by the effect of electricity is called ....
   a. natural magnet.   b. magnetic substance.
   c. electromagnet.   d. (b) and (c).
3. Magnetic effect of the electric current can be detected by using ....
   a. ammeter.   b. compass.   c. iron filings.   d. both (b) and (c).
4. The idea of operating the electromagnet is the changing of ....
   a. kinetic energy into electric energy.
   b. electric energy into mechanical energy.
   c. magnetic energy into mechanical energy.
   d. electric energy into magnetic energy.
5. The bar used in the electromagnet is made up of ....
   a. aluminium.   b. wrought iron.   c. steel.   d. copper.
6. The electromagnet is composed of ....
   a. a copper wire only.   b. a bar of wrought iron only.
   c. a battery.   d. (a) , (b) and (c).
7. .... (is) are from the uses of the electromagnet.
   a. Moving the iron blocks in factories
   b. Making an electric mixer
   c. Making an electric generator
   d. (a) and (b)
8. The magnetic force of the electromagnet will be lost by ....
   a. increasing the number of coil turns.
   b. increasing the number of batteries.
   c. cutting the electric current.
   d. switching on the key.

9. The magnetic force of the electromagnet increases by ....
   a. increasing the number of coil turns only.
   b. increasing the intensity of the electric current only.
   c. cutting off the electric current.
   d. both (a) and (b).
10. All the following devices have an electromagnet inside them except the ....
   a. electric bell. b. television. c. disc drive. d. refrigerator.
11. When an electric current passes through a coil twisted around a wrought iron bar, the wrought iron bar becomes a .... magnet.
   a. temporary b. permanent c. natural d. (a) and (b)
12. An electric current is generated in a coil of an insulated wire when you move a .... inside the coil.
   a. copper bar b. wooden bar
   c. bar magnet d. non-magnetic bar
13. The electric generator (dynamo) works on changing ....
   a. kinetic energy into electric energy.
   b. electric energy into mechanical energy.
   c. magnetic energy into mechanical energy.
   d. electric energy into magnetic energy.
14. The coil of a dynamo is made up of .... wire.
   a. carbon b. copper c. plastic d. graphite
15. .... is the scientist who made the dynamo.
   a. Williams Gilbert b. Faraday
   c. Newton d. No correct answer
16. The dynamo is fixed in the bicycle touching the bicycle's ....
   a. seat. b. pedal. c. tire. d. gear.
17. The apparatus that converts kinetic energy into electric energy is called ....
   a. battery. b. dynamo. c. electric generator. d. (b) and (c).
18. The amount of electricity that is produced from the dynamo can be increased by ....
   a. using a strong magnet.
   b. decreasing the number of turns in the moving coil.
   c. increasing the number of turns in the moving coil.
   d. both (a) and (c).

19. Huge dynamo is used in ....
a. lightening cities. b. bicycle.
c. operating factories. d. (a) and (c).

2. Put (✓) in front of the correct statement and (×) in front of the incorrect one, then correct it :

1. The electromagnet consists of an iron bar and a coil only. ( )
2. The electromagnet changes electric energy into mechanical energy. ( )
3. The electromagnet in winches is used for lifting iron blocks and scrap cars. ( )
4. The electric current can be generated by using a magnet. ( )
5. An electromagnet is formed when an electric current passes through a compass. ( )
6. The magnetic force of the electromagnet increases by decreasing the electric current intensity. ( )
7. The electromagnet losses its power when cutting the electric current. ( )
8. The electromagnet is used in making the disc drive. ( )
9. Ammeter is a device used to measure the electric current intensity. ( )
10. Newton is the scientist who discovered that the magnetic energy can be changed into electric energy. ( )
11. Dynamo changes electric energy into kinetic energy. ( )
12. The deflection of the ammeter's pointer increases by increasing the motion of the coil. ( )
13. The small dynamo in a bicycle consists of a small cylinder that touches the bicycle's tire and this cylinder is connected to a U-shaped magnet. ( )
14. Huge dynamo is used in the bicycle to light the lamps. ( )
15. The amount of electricity produced from dynamo increases by using weak magnets. ( )
16. Magnetism is always related to electricity. ( )
17. Electricity can be produced from magnetism, but magnetism can't be produced from electricity. ( )

4
Lesson

3. Write the scientific term of each of the following statements :

1. A device that is made up of a copper wire twisted around a wrought iron bar and the wire is connected to a battery. (..............)
2. A device used to change electric energy into magnetic energy. (..............)
3. A device used to detect the magnetic effect of the electric current. (..............)
4. A device used for lifting several tons of steel and scrap cars. (..............)
5. A metal used in making the electromagnet. (..............)
6. The magnet that is made by the effect of the electric current. (..............)
7. A scientist who discovered that kinetic energy can be changed into electric energy. (..............)
8. An instrument used in the electric winches and electric bells. (..............)
9. A set that is used to change mechanical energy into electric energy. (..............)
10. A set used in the bicycle to lighten the lamps. (..............)
11. An instrument used in the electric power stations. (..............)
12. A device composed of a copper wire and a magnet. (..............)
13. An instrument that consists of many great coils that turn between the two poles of a huge magnet. (..............)
14. An instrument that is used to generate large amounts of electricity to lighten the cities and operate factories. (..............)
15. A device used to measure the electric current intensity. (..............)

4. Complete the following statements :

1. Electric current has .... effect
2. By putting the compass beside an electric wire, where the electric current flows, its needle ....
3. The magnet which is made by the effect of electricity is called ....
4. The magnetic force of the electromagnet .... by increasing the number of coil turns.
5. When an electric current flows through a wire twisted (winding) around a wrought iron nail, the nail becomes an ....
6. The magnetic force of the electromagnet increases by increasing the intensity of .... passing through the coil.
7. The electromagnet consists of .... , ... and ....
8. The idea of working of the electromagnet is the changing of .... energy into .... energy.

9. The electromagnet loses its magnetism when ....
10. .... is used to pick up (move) the huge blocks of iron.
11. The magnet has .... effect.
12. .... is the scientist who discovered how to make the dynamo.
13. When you move a coil between two poles of a magnet, ... is generated in the coil.
14. The basic idea of the electric generator is the changing of .... energy into .... energy.
15. Moving a bar magnet through a coil produces ....
16. The dynamo consists of .... and ....
17. .... and .... are examples of dynamo.
18. The electric current produced by the electric generator (dynamo) increases by .... or ....
19. The apparatus that converts kinetic energy into electric energy is called ....
20. Huge electric generator is used to generate large amounts of electricity used for .... and ....
21. A huge electric generator is used in .... stations.

5. Give reasons for the following :

1. When an electric current flows through a wire winding around a wrought iron nail, the nail attracts iron filings.
....
....
2. When an electric current flows through a wire that is put beside a compass, the compass needle deflects.
....
3. The lifted steel blocks by huge electromagnet fall down by cutting the electric current that flows through the coil of the electromagnet.
....
4. The presence of a battery in the electromagnet is important.
....
5. The electromagnet is very important.
....
....

4
Lesson

6. The magnet which is made by electricity is called temporary magnet.
....
7. The small cylinder in the bicycle's dynamo touches the bicycle's wheel tire.
....
....
....
8. The deviation of the ammeter's pointer when moving the copper wire between the two poles of a magnet.
....
9. The deflection of ammeter's pointer increases by increasing the motion of coil between the two poles of a magnet.
....
10. The huge electric generator is used in electric power stations.
....
11. Dynamo changes mechanical energy into electric energy.
....
12. In dynamo, we use a strong magnet and increase the number of turns in the moving coils.
....

6. What happens when ... ?

1. An electric current flows through a wire winding around a wrought iron bar.
....
2. An electric current flows through a wire winding around a wrought iron nail that is immersed in iron filings.
....
3. Cutting off the electric current passing through the coil of the electromagnet of the winch.
....
4. A magnet is moved inside a coil of wire that is connected to an electric lamp.
....
5. You move a magnet through a coil or moving a coil between the two poles of a magnet.
....
6. Increasing the motion of coil between the two poles of a magnet in the dynamo.
....

7. **Compare between the electromagnet and dynamo according to scientific idea and structure.**

....

....

....

....

8. **Explain :**

1. How can you increase the magnetic force of the electromagnet ?

....

....

....

2. How can you increase the produced amount of electricity from the dynamo ?

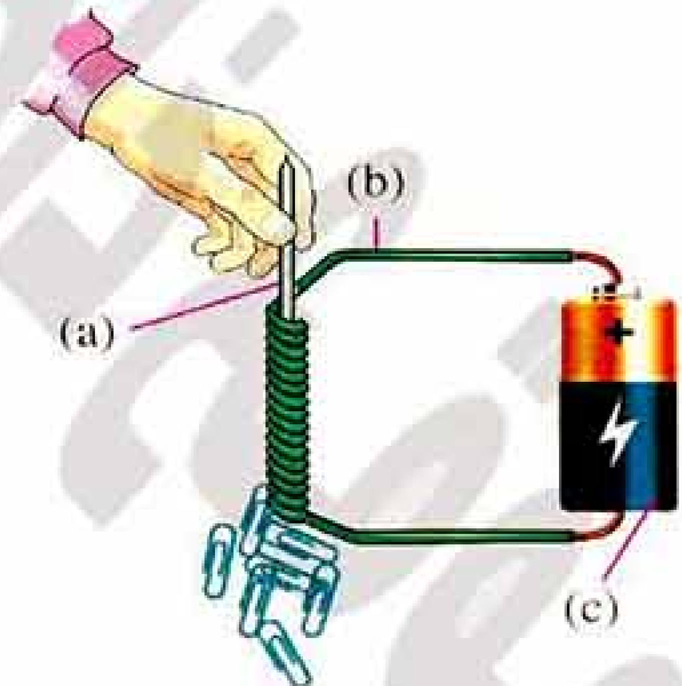
....

9. **What is the composition of the bicycle's dynamo ?**

....

....

10. **Look at the following figure, then answer the following :**



1. Label the diagram.
   - (a) ....
   - (b) ....
   - (c) ....
2. This figure represents ....
3. Mention two uses of this structure.

....

....

4. What happens to part (a) if part (b) is separated from (c) ?

....

11. **What is meant by electromagnet ?**

....

4
Lesson

12. Mention one use of each of the following :

1. Huge electromagnet.

....

2. Huge dynamo.

....
....

3. Big-sized winches (cranes).

....

13. Look at the following figures, then answer the following :

1. Observation on figure (a):

....

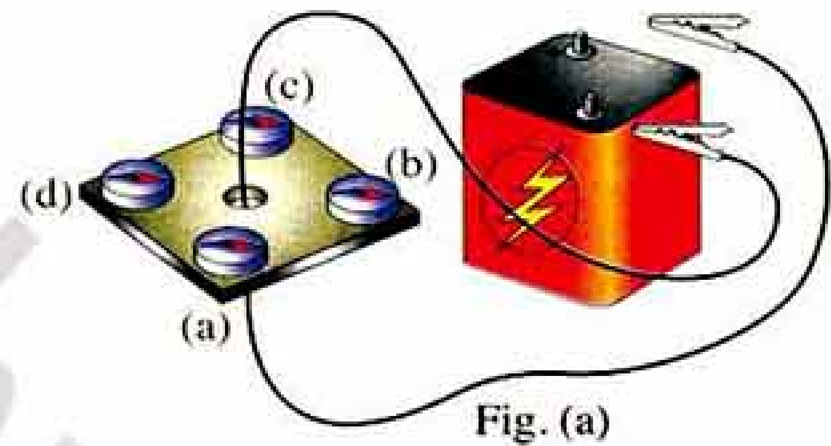


Fig. (a)

2. Observation on figure (b):

....

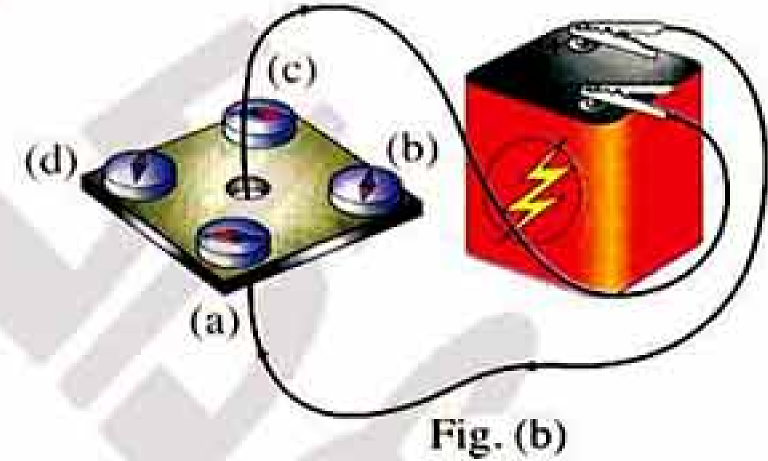
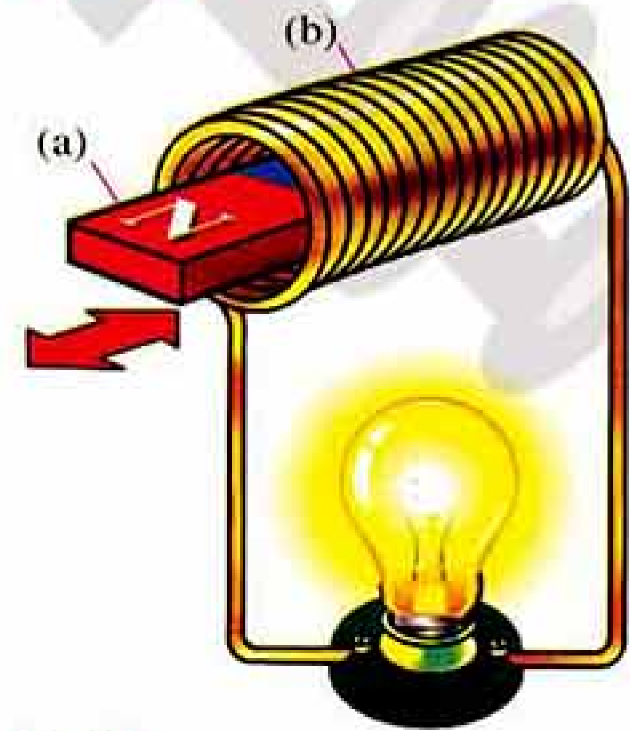


Fig. (b)

3. General inference:

....

14. Look at the opposite figure, then complete the following :



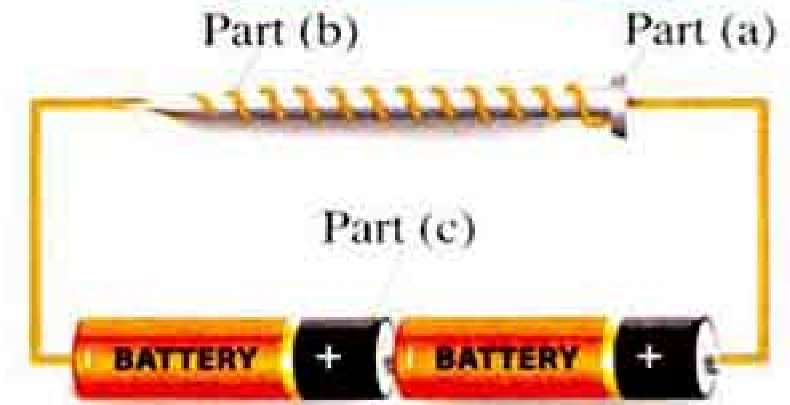
1. Part (a) indicates .... and part (b) indicates ....
2. When part (a) is moved inside part (b), ... is generated in part (b).
3. This means that .... energy can be changed into .... energy.
4. This is the idea of making ....

Timss Questions



1. Which parts in the opposite figure increase the magnetic force ?

....



2. Iman has a sample of iron nails and paper clips. When she tries to make some repairs, some nails and paper clips fall from her in the garden of her home. She has a battery, a piece of copper wire and a soft iron nail.

How does she use them to collect these materials ?

....

....

....

....

....

3. Look at the following figures, then answer the following questions:

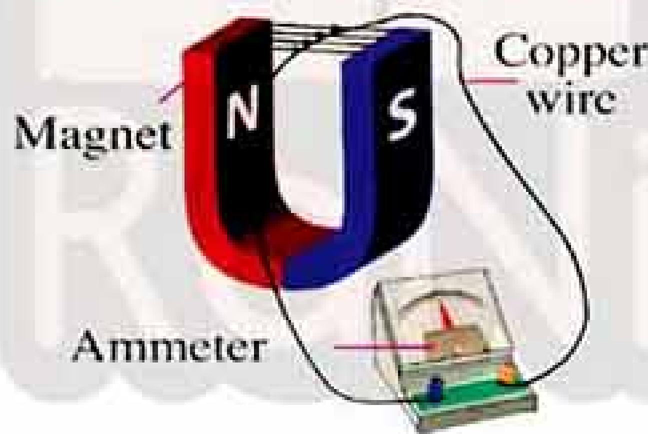


Fig. (a)

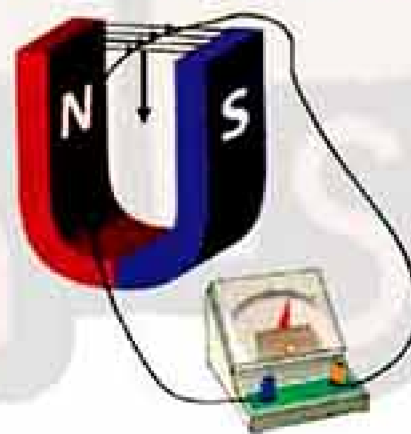


Fig. (b)

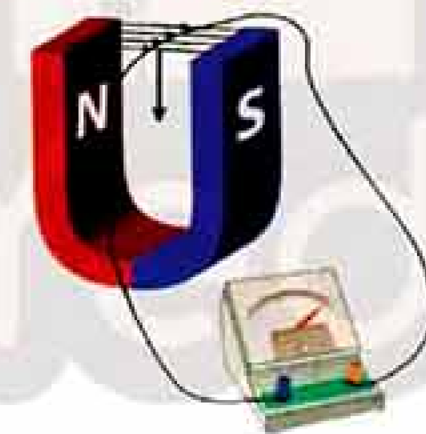


Fig. (c)

a. In figure (a), we observe that the pointer of the ammeter ....

b. In figure (b), we observe that the pointer of the ammeter ....

c. In figure (c), we observe that the deflection of the pointer of the ammeter ....

4. Mention one difference between a small dynamo in a bicycle and a huge dynamo in an electric power station ?

....

....

....

....

Mixtures

UNIT TWO

Lessons of the unit :

1. Mixtures.
2. Solutions.

Unit Objectives : By the end of this unit, you will be able to :

- Conclude the concept of a mixture and list some examples of mixtures.
- Distinguish between different types of mixtures.
- Recognize the concept of solubility process.
- List examples of solvents and solutes in some solutions.
- Distinguish practically between the solubility of materials.
- Perform experiments to investigate factors affecting solubility.

Lesson 1 Mixtures

What is the difference between the components of each plate ?

- Plates (1) and (3) contain only one type of matter ,while plates (2) and (4) contain different types of matter.


Plate (1)


Plate (2)


Plate (3)


Plate (4)

mixture مخلوط plate طبق

1
Lesson

Types of matter

Matter can be classified into :

A Pure substance

It is the substance that is made of only one type of identical particles.

Examples :



Distilled (pure) water



Sugar



Baking soda

B Mixture

It is the substance that consists of more than one type of particles.

Examples :



Concrete



Tomato sauce



Mineral water
(mixture of water and some useful minerals as calcium and magnesium)

Notes

- Atmospheric air (mixture of different gases as oxygen, nitrogen, carbon dioxide and water vapour).
- Solution is a special type of mixtures, where its components are mixed and interfere till you can't distinguish between its particles.



pure substance	مادة نقية	baking soda	صودا الخبز	concrete	الخرسانة	components	مكونات
identical particles	جزيئات متماثلة	distilled water	ماء مقطر	interfere	يتداخل		

G.R.

- **Both sugar and distilled water are considered pure substances.**
  Because each of them is composed of only one type of identical particles.
- **Both milk and concrete are considered mixtures.**
  Because each of them consists of more than one type of particles.

Mixtures

Now, we are going to study

1. Types of mixtures
2. Properties of mixtures
3. Formation of mixtures
4. Separation of mixtures

1 Types of mixtures

There are many different types of mixtures, but we will mention some of them.

a **Solid-solid mixture :**

- It consists of two or more different solid matter.

Examples:

1. Fruit salad.
2. Vegetable salad.



Fruit salad

b **Liquid-liquid mixture:**

- It consists of two or more different liquids.

Examples:

1. Mixture of vinegar and water.
2. Mixture of oil and water.
3. Mixture of oil and vinegar (dressing of salad).



Oil and water

c **Solid-liquid mixture:**

- It consists of solid and liquid matter.

Examples:

1. Mixture of sand and water.
2. Mixture of salt and water.



Salt and water

formation تكوين	dressing توابل	vegetable salad سلطة خضروات	
fruit salad سلطة فواكه	separation فصل	vinegar الخل	

1 Lesson



d **Gaseous-gaseous mixture :**

- It consists of different gases.

Example:

- Atmospheric air which is a mixture of *oxygen gas*, *nitrogen* gas, *carbon dioxide* gas and *water vapour*.



e **Gaseous-liquid mixture :**

- It consists of gaseous and liquid matter.

Example:

- A mixture of soda water that is produced from dissolving carbon dioxide gas in sugar solution.

2 Properties of mixtures

Look at the following mixtures to deduce their properties:



Vegetable salad

1. You can separate the tomato from the salad easily and eat it separately.



Fruit salad

2. The strawberry in the fruit salad keeps its taste and colour before and after mixing.



Vegetable soup

3. You can add or remove the desired amount of vegetables in your vegetable soup.

SO, the properties of the mixture are :

1. The components of the mixture do not join (react) together and can be separated easily.
2. Each component in a mixture keeps its own properties,so the properties of a mixture are the same properties of its components.
3. The components of the mixture can be mixed at any ratio.

soda water	ماء الصودا	desired amount	الكمية المرغوبة	join	يرتبط
dissolving	إذابة	ratio	نسبة	separately	منفصلاً
sugar solution	محلول سكر	deduce	يستنتج	react	يتفاعل

G.R.

A mixture of sand and iron filings can be separated easily.

Because the components of the mixture do not react together.

Exercise

Put (✓) or (✗) :

1. *The components of a mixture must be mixed with a specific ratio.* ( )
2. *The components of a mixture can be separated easily.* ( )
3. *The properties of a mixture are the same properties of its components.* ( )

3 Formation of mixtures

Mixture can be formed by different methods such as:

1. Shaking.
2. Stirring.
3. Grinding.

Where,

⊙ **Solid and liquid materials** can be mixed by shaking or stirring.



Example:
Mixture of salt and water.

⊙ **Liquid materials** can be mixed by shaking or stirring.



Example:
Mixture of strawberry juice and banana juice.

⊙ **Solid materials** can be mixed by shaking or grinding.



Example:
Mixture of salt and pepper.

shaking	رج	stirring	التقليب	grinding	الطحن
methods	طرق	pepper	فلفل		

1 Lesson

Activity 1 To show how you can make a mixture.

Tools:

Conical flask with a lid – water – vinegar – oil – sand – salt.

Steps	Figures	Observations
1. Add an amount of salt to an amount of water in the flask. 2. Put the lid on the flask and shake it gently, then wait a minute.	Lid; Salt + Water	- Salt dissolves in water and disappears forming salty solution which can't be affected by time.
3. Repeat the previous steps by adding: a. Oil to water.	Oil; Water	- On shaking, they interfere in each other, then oil separates from water by time.
b. Sand to water.	Water; Sand	- On shaking, they seem to be mixed together, but by time sand precipitates.
c. Water to vinegar.	Water + Vinegar	- Water and vinegar are mixed together giving a mixture that can't be affected by time.

Inference :

A mixture can be formed by mixing two or more different matter together.

lid سدادة conical flask إناء مخروطى gently برفق

4 Separation of mixtures

As you have studied that the components of the mixture don't react together, so they can be separated easily by simple methods such as:

1

Magnetic attraction:
is used to separate solid mixtures that contain magnetic substances.

Example:
Mixture of sand and iron filings.



2

Filtration process:
is used to separate solid materials that are **insoluble** in water.

Example:
Mixture of sand (or mud) and water.



3

Evaporation process:
is used to separate solid materials that are **soluble** in water.

Example:
Mixture of salty solution.



4

Separating funnel:
is used to separate liquid mixtures whose components don't mix together.

Example:
Mixture of oil and water.



filtration	عملية الفلترة	soluble	تنوب	mud	طين
insoluble	لا تنوب	separating funnel	قُمع الفصل		

1 Lesson

Activity 2 To separate a solid mixture that contains magnetic substances by using magnetic attraction.

Tools:

Iron filings - some sand - magnet.

Step:

Approach a magnet to a mixture of sand and iron filings as shown in the opposite figure.



Observation:

The magnet attracts iron filings only.

Inference :

A magnet (magnetic attraction) is used to separate the solid mixtures that contain magnetic substances as iron.

Activity 3

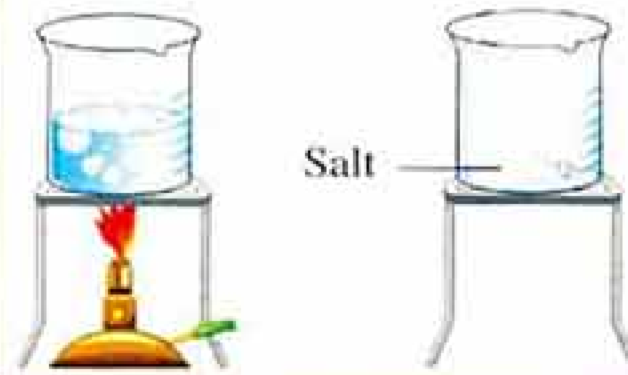
- To separate a solid-liquid mixture by filtration and evaporation processes.
- To separate a mixture of sand and salt solution.

Tools:

Salt – sand – water - a funnel – filter paper – two beakers – a flame – a stand (holder).

Steps	Figures	Observations
1. Form a mixture of salt, sand and water in a beaker and stir it well.	Salt + Sand + Water; Beaker	- The salt dissolves in water, while sand doesn't dissolve.
2. Pour the mixture into the funnel that has a filter paper as shown in the figure.	Filter paper; Stand; Sand; Funnel	- The filter paper separates sand and lets the salty solution pass through it.

pour صُب funnel قُمع beaker دورق filter paper ورقة ترشيح

3. Boil the filtrated salty solution gently.		- The water evaporates and the salt remains in the beaker.

Inferences :

1. Filtration process is used to separate the solid materials that are insoluble in water such as sand.
2. Evaporation process is used to separate the solid materials that are soluble in water such as salt.

G.R.

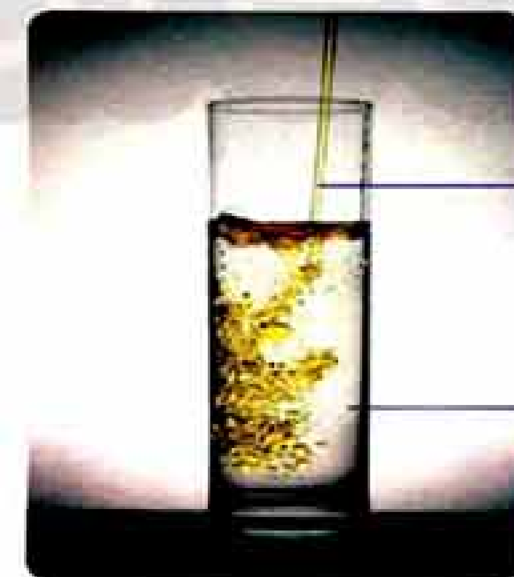
1. A magnet can be used to separate iron filings from sand.
Because the magnet attracts the iron filings only and separate them from the mixture.

2. Filtration process is used to separate sand from sugary solution.
Because filtration process is used to separate the solid materials as sand that are insoluble in water.

Activity 4 To separate a liquid mixture (water-oil mixture) by using a separating funnel.







Tools:

A separating funnel - a beaker - water - oil.

Steps:

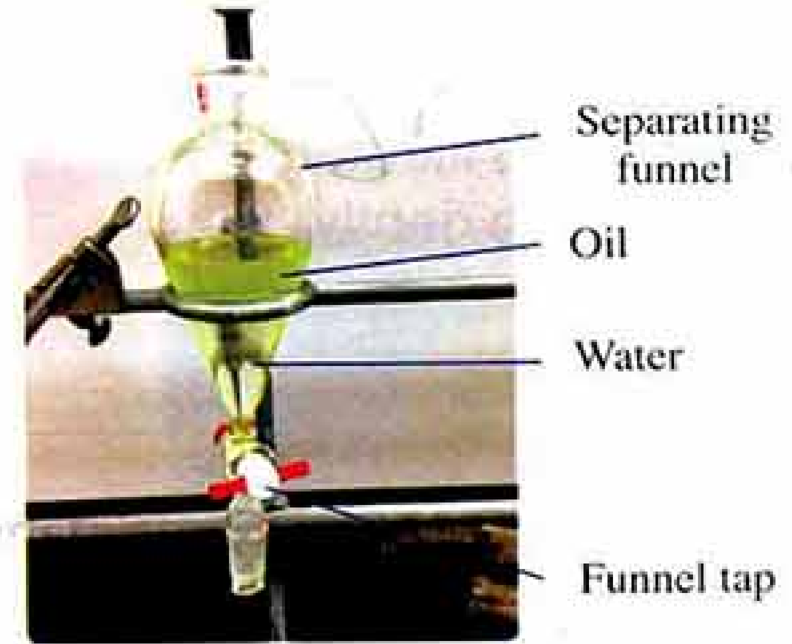
1. Add an amount of oil to a cup containing water and shake it well.

Observation:

Oil doesn't mix with water, but it forms a layer floating on the water surface.

filtrated	المادة المرشحة	floating	طافية	salt pans	أحواض الملح	layer	طبقة

2. Pour this mixture in the **separating funnel** as shown in the figure and use the funnel tap to separate water from oil.



Observation:

The water falls down from the separating funnel and can be received in a beaker, but oil remains inside the separating funnel.

Inference :

The separating funnel is used to separate liquid mixtures whose components don't mix together such as water-oil mixture.

Exercise

Complete the following steps to separate the components of a mixture of sand , iron filings and salt.

1. By using a magnet, you can separate .... from the mixture.

2. By adding .... and stirring, a solution is formed.

3. By filtration process, you can separate .... from the salty solution.

4. By .... process, you can separate the salt from the solution.

Try to answer Test yourself 11



tap صنبور

Remember



Pure substance	Mixture
It is the substance that is made of only one type of identical particles. **Examples:** Distilled water - sugar - baking soda.	It is the substance that consists of more than one type of particles. **Examples:** Concrete - tomato sauce - mineral water.

Types of mixtures are :

- Solid-solid mixture as fruit salad.
- Liquid-liquid mixture as a mixture of oil and water.
- Solid-liquid mixture as a mixture of sand and water.
- Gaseous-liquid mixture as soda water.
- Gaseous-gaseous mixture as air.

Properties of mixture :

- Its components don't react together and can be separated easily.
- Each of its components keeps its properties.
- Its components can be mixed at any ratio.

Mixture can be formed by :

- Shaking.
- Stirring.
- Grinding.

Componets of mixtures can be separated by simple methods :

Magnetic attraction is used to separate solid mixtures that contain magnetic substances.

Example:
- Mixture of sand and iron filings.

Filtration process is used to separate solid materials that are insoluble in water.

Example:
- Mixture of sand and water.

Evaporation Process is used to separate solid materials that are soluble in water.

Example:
- Mixture of salty solution.

Separating funnel is used to separate liquid mixtures whose components don't mix together.

Example:
- Mixture of oil and water.

Questions on lesson one




Questions signed by 📖 have been taken from the school book.

1. Choose the correct answer :

1. All the following are pure substances except ....
   a. distilled water. b. mineral water. c. sugar. d. baking soda.
2. When you mix two or more kinds of matter together, the produced matter is called ....
   a. element. b. compound. c. mixture. d. pure substance.
3. .... are examples of mixtures.
   a. Distilled water, baking soda and sugar
   b. Silver, sea water and table salt
   c. Salty solution, sugary solution and mineral water
   d. All the previous answers
4. All of the following are mixtures except ....
   a. milk. b. toothpaste. c. perfume. d. sugar
5. All the following are from the properties of the mixture except ....
   a. its components can't be separated easily.
   b. each component keeps its own properties.
   c. its components are mixed at any ratio.
   d. (b) and (c).
6. Atmospheric air and mineral water are ....
   a. pure substances. b. mixtures.
   c. compounds. d. all the previous answers.
7. Mineral water is ....
   a. a mixture of some minerals and water.
   b. an element.
   c. a mixture of water and table salt.
   d. not a mixture.
8. Fruit salad is an example of ....
   a. liquid mixtures. b. gaseous mixtures.
   c. solid-liquid mixtures. d. solid-solid mixtures.
9. Atmospheric air is considered as ....
   a. a gaseous-gaseous mixture. b. a liquid mixture.
   c. a solid mixture. d. all the previous answers.

10. Mixing salt with water produces a ....
a. solid-liquid mixture.
b. liquid mixture.
c. solid mixture.
d. solid-gaseous mixture.

11. .... is from liquid-liquid mixtures.
a. A mixture of vinegar and water
b. A mixture of sand and water
c. A mixture of lettuce, carrots and tomatoes
d. Air

12. All these methods are used to form mixtures except ....
a. shaking.
b. grinding.
c. stirring.
d. filtration.

13. A mixture of lemon juice and orange juice can be formed by ....
a. shaking.
b. filtration process.
c. grinding.
d. evaporation process.

14. To separate insoluble matter (sand) from salty solution, we use ....
a. filtration process.
b. evaporation process.
c. separating funnel.
d. grinding process.

15. .... is (are) from the physical means used in the separation of mixtures.
a. Filtration process
b. Evaporation process
c. The separating funnel
d. all the previous answers.

16. To separate iron filings from sand, we must use ....
a. a magnet.
b. a separating funnel.
c. evaporation process.
d. filtration process.

17. Table salt is collected by evaporation of ....
a. distilled water.
b. mineral water.
c. salty solution.
d. all the previous answers.

18. The mixture of sand and salt can be separated by ....
a. a separating funnel.
b. dissolving, filtration and evaporation processes.
c. a strong magnet.
d. evaporation process only.

19. All these methods are used to separate mixtures except ....
a. magnetic attraction.
b. filtration process.
c. evaporation process.
d. shaking process.

20. Oil-water mixture can be separated by using ....
    a. a filter paper.
    b. a strong magnet.
    c. a separating funnel.
    d. the evaporation process.

21. To separate salt from salty water, we use ....
    a. a filter paper.
    b. a separating funnel.
    c. the evaporation process.
    d. the magnetic attraction.

2. Choose from column (B) what suits it in column (A) :

(1)

(A)	(B)
1. Sea water is 2. Table salt 3. Oil-water mixture 4. Distilled water is 5. A mixture of iron filings and sand	a. can be separated by a separating funnel. b. a solid-liquid mixture. c. can be obtained by evaporation process of salty solution. d. can be separated by melting. e. a pure substance. f. can be separated by a magnet.

1. .... 2. .... 3. .... 4. .... 5. ....

(2)

(A)	(B)
1. Chalk and water solution	a. by magnetic attraction.
2. Paper clips and flour	b. by filtration, then evaporation.
3. Sugar solution	c. by filtration.
4. Oil and water	d. by evaporation.
5. Sand and salt solution	e. by using the separating funnel.

1. .... 2. .... 3. .... 4. .... 5. ....

(3)

(A)	(B)
1. Stirring 2. Filtration 3. Evaporation 4. Pure water 5. Iron filings and sand mixture	a. is used to separate the soluble solid materials. b. is used in making the solution. c. is used to separate the insoluble solid materials. d. can be separated by using a magnet. e. is pure substance.

1. .... 2. .... 3. .... 4. .... 5. ....

3. Put (✓) in front of the correct statement and (×) in front of the incorrect one, then correct it :

1. Distilled water is a mixture, while mineral water is a pure substance. ( )
2. Sugar and baking soda are mixtures. ( )
3. Mixture is made up of only one type of identical particles. ( )
4. You can see the different components of the salty water. ( )
5. Calcium and zinc are found in mineral water. ( )
6. Mixtures are formed by magnetic attraction, filtration and evaporation processes.
7. Sugar is a mixture ,while sugar solution is a pure substance. ( )
8. Mixtures can be formed by shaking, grinding or stirring. ( )
9. A mixture of salt and pepper is formed by grinding. ( )
10. A mixture of banana and strawberry juices is formed by stirring or shaking. ( )
11. Vegetable salad is considered a mixture. ( )
12. The components of the mixture don't react together. ( )
13. The properties of the mixture are the same properties of its components. ( )
14. Separating funnel is used in separating heterogeneous mixtures. ( )
15. Sand-water mixture is separated by a separating funnel. ( )
16. Filtration is used to separate oil-water mixture. ( )
17. Salt and water are mixed together by stirring or heating. ( )
18. Solubility, filtration and evaporation are ways of separating mixtures. ( )
19. Filtration is used to separate a mixture that has a soluble solid material. ( )
20. We use filtration process to separate mixtures which have deposits. ( )
21. We can use evaporation process to separate crushed coffee from water. ( )

4. Write the scientific term of each of the following :

1. Substances that are made up of only one type of identical particles. (   )
2. Substances that are made up of more than one type of particles. (   )

3. Substances whose components can be separated easily. (...............)
4. A method used to form salt-pepper mixture. (...............)
5. A mixture of oxygen, nitrogen, small amounts of carbon dioxide and water vapour. (...............)
6. A mixture produced by dissolving carbon dioxide gas in sugary solution. (...............)
7. A mixture results from the solubility of solids in liquid. (...............)
8. A mixture that contains water, calcium and magnesium. (...............)
9. A process used in the formation of a solution. (...............)
10. Leaving an amount of table salt solution exposed to sun rays for many days. (...............)
11. A type of matter whose components keep their own properties. (...............)
12. A method used to separate a soluble solid material from water. (...............)
13. A method used to separate a mixture of sand and water. (...............)
14. Heating a salty solution gently. (...............)
15. A structure that is used to separate iron-salt mixture. (...............)
16. A device that is used to separate water-oil mixture. (...............)
17. A method used to separate magnetic substances from any solid mixture. (...............)

5. Complete the following statements :

1. Matter can be classified into two groups which are .... and ....
2. Substance that made up of only one type of identical particles is called .... , but .... consists of more than one type of particles.
3. Tomato sauce, sugary solution and sea water are examples of ....
4. Milk, air and concrete are examples of .... , while distilled water and baking soda are examples of ....
5. Vegetable salad is considered as a ....
6. .... , ... and .... are from the types of mixtures.
7. Vinegar and water is .... mixture, while sand and water is .... mixture.
8. Air is a mixture of .... , ... , water vapour and nitrogen.
9. Mineral water is a .... which consists of water and minerals such as .... and magnesium.

10. Air is a .... mixture, while dissolving carbon dioxide gas in a sugary solution is a .... mixture.
11. In the .... , each component keeps its own properties.
12. The components of the mixture .... together, so they can be separated easily.
13. Mixtures can be formed by .... , ... and grinding.
14. A mixture of salt and pepper can be formed by .... or ....
15. A mixture of banana and strawberry juices can be formed by .... or ....
16. .... and .... are ways of mixing solid materials.
17. A mixture of sugar and water can be formed by .... or ....
18. Components of a mixture can be separated by .... , ... or evaporation process.
19. Iron filings and sand can be separated by using ....
20. We can separate a mixture of paper clips and flour by using ....
21. .... process is used to separate sand from water.
22. .... process is used to separate a soluble salt from its solution.
23. .... is used to separate water-oil mixture.
24. .... process is used to separate solid-liquid mixtures which contain insoluble solid materials.
25. .... is used to separate liquid mixture that its components don't mix together, while .... and .... processes are used to separate a mixture of sand and salty solution.

6. Give reasons for the following :

1. Both distilled water and baking soda are pure substances.
....
....
2. Both milk and tomato sauce are mixtures.
....
3. Air is considered a mixture.
....
....
4. Mineral water is considered a mixture.
....

5. Strawberry juice and lemon juice can be mixed by shaking or stirring.

6. Filtration process is used to separate sand from sugary solution.

7. A magnet can be used to separate iron filings from sand.

8. A mixture of sand and iron filings can be separated easily.

9. A mixture of salt and water is different from a mixture of sand and water.

10. No mixing will happen on adding sand to water.

11. The method used to separate a mixture of iron filings and sand is different from that used to separate a mixture of sand and water.

12. Some mixtures can be separated by using the separating funnel.

7. What happens when ...?

1. Shaking or stirring some sugar with water.

2. Putting an amount of sand in a cup of water and shaking, then waiting for a minute.

3. Mixing an amount of oil with an amount of water.

4. Heating salty water for a long time.

5. Grinding salt with pepper.

6. Dissolving carbon dioxide gas in a sugary solution.

7. Approaching a magnet to a mixture of sand and steel paper clips.

8. Leaving an amount of table salt solution exposed to sunlight for several days.
....
9. Mixing different types of juices together.
....

8. Mention one use of each of the following :

1. Filter paper (filtration process).
....
2. Evaporation process.
....
3. Grinding process.
....
4. Magnet.
....
5. Separating funnel.
....
6. Stirring process.
....

9. Show how you can separate the following :

1. Salt from salty water.
....
2. Iron filings from sand.
....
3. Oil from oil-water mixture.
....
4. Sand from water-sand mixture.
....
5. A mixture of steel paper clips and flour.
....
6. Chalk powder from water.
....
7. Coffee from water.
....
8. Water contains mud.
....

10. Define the following :

1. Pure substance.

....

2. Mixture.

....

11. When do we use the following separating methods and mention an example of each ?

1. Filtration process.

....
....

2. Evaporation process.

....
....

12. Mention the methods (ways) to separate mixtures and when each way can be used.

....
....
....
....
....
....

13. Name three types of mixtures in a table according to their components.

....
....
....

14. Look at the opposite figure, then answer the following :



1. What is shown by this figure ?

....

2. Why do we use this tool in separating some types of mixtures ?

....
....

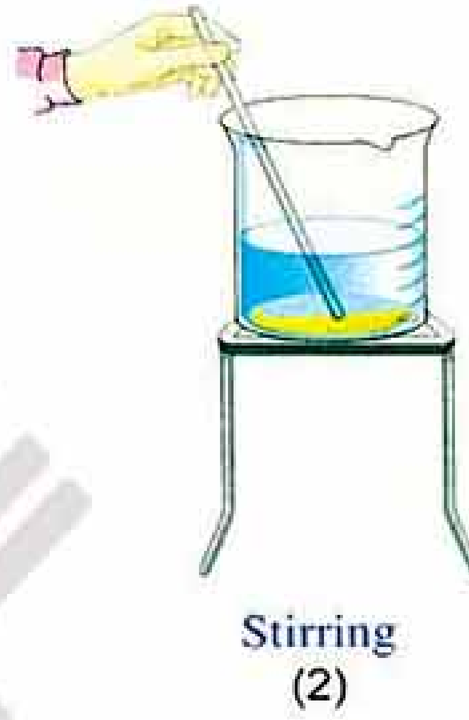
3. What is the mixture that can be separated by this tool ?

....

15. You have an amount of sugar mixed with an amount of sand and an amount of water. Arrange the following steps to separate the components of this mixture.



Filtration
(1)


Stirring
(2)


Evaporation
(3)

16. Look at the opposite mixture, then answer the following :



1. What is the type of this mixture ?

....

2. Does the mixing process affect the properties of each component in the mixture ?

....

17. Look at the opposite figure, then answer the following questions :



1. What's the mixture that can be separated in the figure ?

....

2. Mention the way of separation in this case ? Give the reason ?

....

18. Compare between:

Pure substance	Mixture
....	....
....	....

Timss Questions



1. Classify the following mixtures according to their types, then mention another example of each type :



Fruit salad

....

....



Soda water

....

....



Air

....

....



Oil in water

....

....



Sugar in water

....

....

2. A mixture of oil and vinegar is a .... mixture. Complete the previous statement and mention how you can separate a mixture of oil and vinegar ?

....

3. In a box of flour there is an iron nail, which is the easiest way to find the iron nail ? ....

a. Pour water on the flour.
b. Use a magnifying glass.
c. Use a magnet.
d. Heat the flour.

4. To separate a solution of black pepper and salt ....

a. add water to collect the pepper.
b. Pick out the pepper from salt by hand.
c. add water, filter out the pepper and boil off the water to get the salt.
d. add water, filter out the salt and boil off the water to get the pepper.



Lesson 2
Solutions

What is the difference between fig. (a) and fig. (b) ?


Fig. (a)


Fig. (b)

- In fig. (a) particles of salt are not seen suspended throughout the water after stirring.
- In fig. (b) particles of mud are seen suspended throughout the water after stirring.

Homogeneous mixture	Heterogeneous mixture
It is the mixture in which its components can't be distinguished from each other. **Examples:** A salty solution - apple juice - tea.	It is the mixture in which its components can be distinguished from each other. **Examples:** Mud in water - chalk in water - natural orange juice.

solution	محلول	homogeneous mixture	مخلوط متجانس	suspend	يُعلق
heterogeneous mixture	مخلوط غير متجانس	distinguished	تتميز	throughout	خلال

2 Lesson

G.R.

- **Salty solution is a homogeneous mixture.**
  Because its components can't be distinguished from each other.
- **Apple juice is a solution.**
  Because it is a homogeneous liquid mixture.

Formation of the solution





The solution consists of :

1 Solvent

Solvent:

It is the substance in which solute disperses or dissolves.

Examples:

Water, alcohol, benzene, ... etc.



2 Solute

Solute:

It is the substance which dissolves in a solvent.

Examples:

Salt, sugar, ... etc.



The solubility (dissolving) of a solute in a solvent produces "solution".

Notes



Water is called a common solvent as thousands of substances dissolve in it.

Solution:

It is a homogeneous mixture in which the solute breaks down into its most basic particles that spread throughout the solvent.

Examples:

A salty solution, apple juice and tea.

disperse ينتشر	solvent مُذيب	solute مُذاب	
break down يتحلل	basic particles جزيئات أساسية	solubility ذوبان	

Exercise

Mention the solute and the solvent in each of the following solutions:

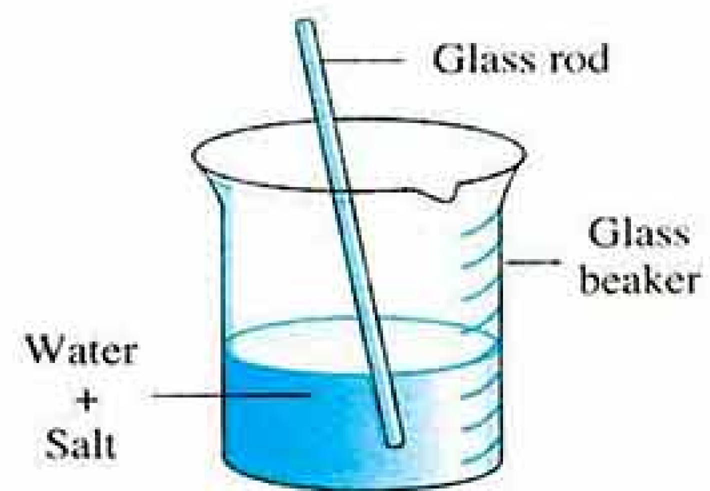
Solution	Solute	Solvent
1. Chocolate-milk.	Chocolate	Milk
2. Sugary solution.	....	Water
3. Salty solution.	....	....



Activity 1 To show the formation of a solution (solubility process).

Step:

Put a spoon of salt in an amount of water, then stir by using a glass rod.



Observation:

Salt breaks down into small particles that disappear in water forming a salty solution.

Inferences :

1. The formed salty solution consists of:
   a. A solute which is salt. b. A solvent which is water.
2. Stirring process is necessary to dissolve the solute in the solvent.
3. Solubility process can be expressed as follows :



$$\text{Solute} + \text{Solvent} \xrightarrow[\text{Process}]{\text{Solubility}} \text{Solution.}$$

Solubility process:

It is the process by which a solute dissolves in a solvent leading to the disappearance of the solute.

G.R.

In a sugary solution, sugar is considered the solute.
Because it dissolves in the solvent (water) to form the sugary solution.

disappearance إختفاء express يصف glass rod ساق زجاجى



2
Lesson

Substances can be classified according to their solubility into:

A soluble substance

- It is the substance that dissolves (disappears) in a solvent.
- The formed homogeneous mixture is called solution.

Example :
Salt in salty solution.

An insoluble substance

- It is the substance that does not dissolve (suspends) in a solvent.
- The formed heterogeneous mixture is called suspension.

Example :
Mud in water.

Suspension:

It is a heterogeneous mixture in which some particles of the solute are suspended throughout the solvent.

Examples:

- Mud in water.
- Natural orange juice.


Mud in water

Notes

Suspension can be separated by filtration process.

G.R.

- **Tea and sugary solution are homogeneous liquid mixtures (solutions).**
  Because the components of each of them can't be distinguished from each other.
- **Mud in water is a heterogeneous mixture (suspension).**
  Because the particles of mud can be distinguished from water.

suspension مُعلق soluble ذائب insoluble غير ذائب



Question

Classify the following mixtures into homogeneous liquid mixtures (solutions) and heterogeneous liquid mixtures (suspensions).


Apple juice


Natural orange juice


Tea


Salty solution


Mud in water

Answers

* *Apple juice, tea, salty solution are homogeneous liquid mixtures (solutions).*
* *Natural orange juice and mud in water are heterogeneous liquid mixtures (suspensions).*

Do you know ?

Structure of blood :

Your blood is a mixture of elements and compounds because :

- It contains white blood cells, red blood cells, water and number of dissolved substances.
- The different components of blood can be separated and used by doctors.
- The ratio of these substances in your blood changes daily, but the identity of the mixture doesn't change.

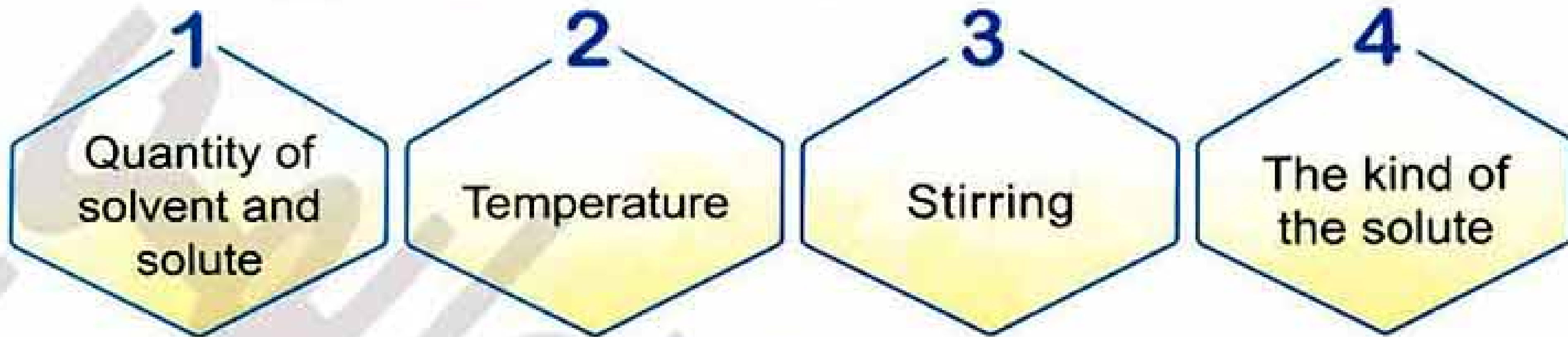

Sample of blood

white blood cells خلايا الدم البيضاء identity الهوية / التكوين red blood cells خلايا الدم الحمراء

2 Lesson

Factors affecting the solubility process

The solubility process is affected by four factors :



1 Quantity of solvent and solute



Activity 2 **To prove that a quantity of solvent and solute affects the solubility process.**

Tools:

Glass rod - 2 beakers - a quantity of water - a quantity of sugar - stop watch.



Steps:

1. Get two equal quantities of sugar (solute), then put the first quantity in 300 ml. of water (solvent) and the other quantity in 50 ml. of water.
2. Stir well with a glass rod and record the time needed for sugar to dissolve completely in each case.

Observation:

- Dissolving sugar in 300 ml. of water takes a shorter time than that needed to dissolve the same quantity in 50 ml. of water.

3. Try to dissolve 20 gm. of sugar in 100 ml. of water and 5 gm. of sugar in the same quantity of water.
4. Record the time needed to dissolve sugar in each case.



record سجل quantity كمية

Observation:

Dissolving 5 gm. of sugar takes a shorter time than 20 gm. of sugar.

Inferences :

Solubility process depends on the amount of solvent and solute, where:

- By increasing the quantity of solvent, the speed of solubility increases and vice versa.
- By decreasing the quantity of solute, the speed of solubility increases and vice versa.

G.R.

Solubility depends on the amount of solvent and solute.

2 Temperature

Activity 3 To prove that temperature affects the solubility process.

Steps:

1. Put two equal amounts of sugar in two beakers containing the same amount of water as in figures (a & b).
2. Heat beaker (b) and leave beaker (a) without heating, then record the time needed to dissolve sugar in each case.

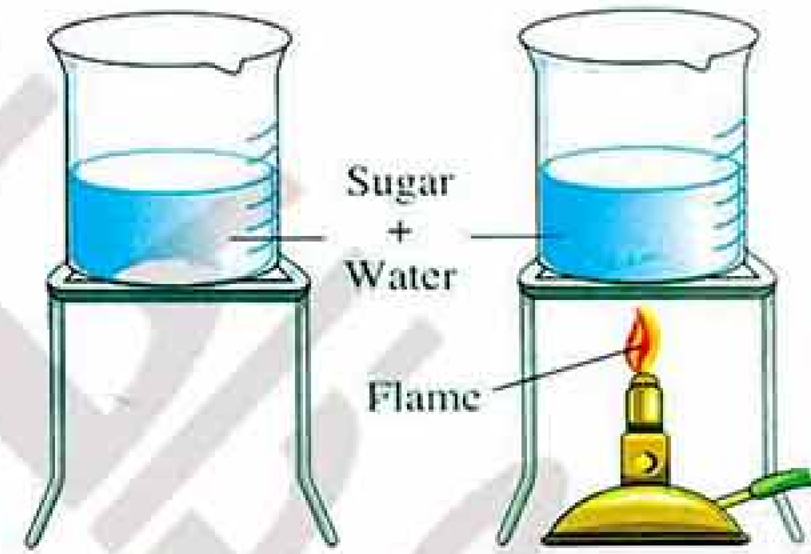


Fig. (a) Fig. (b)

Observation:

Sugar in beaker (b) takes a shorter time to dissolve than in beaker (a).

Inference :

By increasing temperature and using the same amount of solvent and solute, the dissolving (solubility) time decreases.

G.R.

Dissolving sugar in hot water is faster than in cold water.

Because when the temperature increases the speed of the solubility increases.



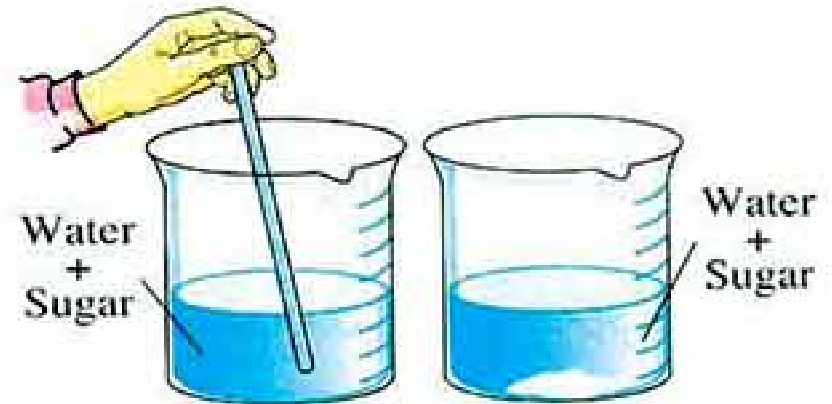
speed of solubility سرعة الذوبان vice versa والعكس بالعكس

Lesson 2

3 Stirring

Activity 4 To prove that stirring affects the solubility process.

Steps:



1. Put two equal amounts of sugar in two beakers containing the same amount of water.
2. Stir one of them and leave the other without stirring as shown in the figure.
3. Record the time needed to dissolve sugar in each case.

Observation:

In case of stirring, the sugar takes a short time to dissolve.

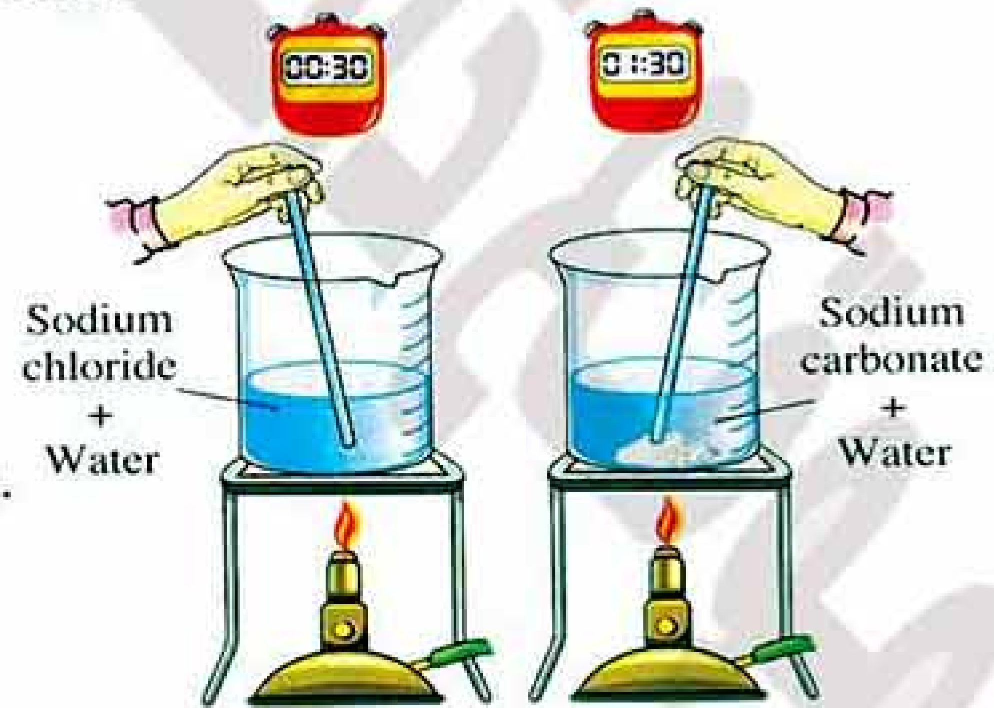
Inference :

Stirring increases the speed of the solubility process.

4 The kind of the solute

Activity 5 To prove that the kind of the solute affects the solubility process.

Steps:



1. Put an amount of sodium chloride (table salt) in a beaker containing water and put the same amount of sodium carbonate and water in another beaker.
2. Heat both of them gently with stirring.
3. Record the time needed to dissolve each substance.

Observation:

The time needed to dissolve sodium chloride differs from that needed to dissolve sodium carbonate.

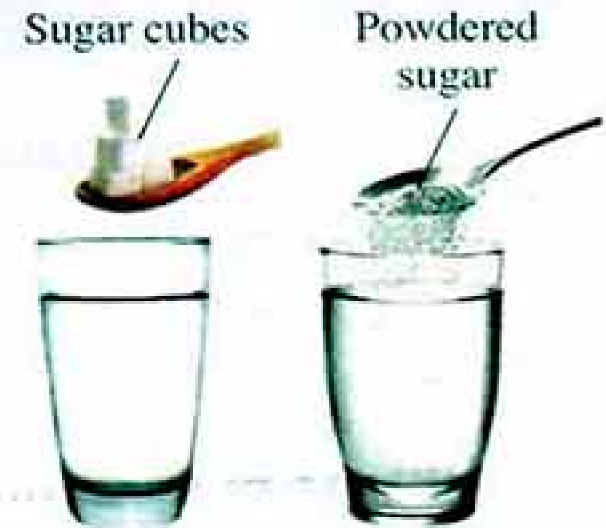
Inference :

The solubility process depends on the kind of the solute.

kind of the solute — نوع المذاب

Do you know ?

Surface area of the solid material affects the solubility process.



If you have 2 gm. of sugar cubes and 2 gm. of powdered sugar. Which amount of sugar dissolves faster in 100 ml. of water ? Why ?

The 2 gm. of powdered sugar, because cracking (grinding solid materials) gives a larger surface area exposed to the solvent that makes the solubility process gets faster.



Notes

- Shaking has the same effect of stirring process.
- The necessary factors to decrease the solubility time (increase the solubility speed) are:
  1. Heating.
  2. Stirring.
  3. Increasing the amount of solvent.
  4. Decreasing the amount of the solute.
  5. Grinding the solid materials.

Try to answer :
* Test yourself 12
* General exercise of the school book on unit 2
* Model Exams on unit 2





cracking الطحن



Remember



Homogeneous mixture	Heterogeneous mixture
It is the mixture in which its components can't be distinguished from each other. **Example:** Solutions.	It is the mixture in which its components can be distinguished from each other. **Example:** Suspensions.

Solution	Suspension
It is a homogeneous mixture in which the solute breaks down into its most basic particles that spread throughout the solvent. **Examples:** Salty solution, apple juice and tea.	It is a heterogeneous mixture in which some particles of the solute are suspended throughout the solvent. **Examples:** Mud in water, chalk in water and natural orange juice.

- **Solubility process:** It is the process by which a solute dissolves in a solvent leading to the disappearance of the solute.

The solute	The solvent
It is the substance which dissolves in a solvent. **Example:** Salt in salty solution.	It is the liquid substance in which a solute dissolves. **Example:** Water in salty solution.

- **Water** is a common solvent as thousands of substances dissolve in it.
- **Factors affecting the solubility process are :**
  1. Quantity of solvent and solute.
  2. Temperature.
  3. Stirring or shaking.
  4. The kind of the solute.
  5. Grinding the solid materials.

Questions on lesson two



1. Choose the correct answer:

1. The solution is ....
   a. a homogeneous liquid mixture. b. a heterogeneous liquid mixture.
   c. a gaseous mixture. d. a solid mixture.
2. Apple juice is ....
   a. a homogeneous liquid mixture. b. a solution.
   c. a heterogeneous liquid mixture. d. (a) or (b).
3. Mud in water is an example of ....
   a. heterogeneous liquid mixtures. b. solutions.
   c. suspensions. d. (a) or (c).
4. All the following are examples of homogeneous liquid mixtures except ....
   a. apple juice. b. orange juice.
   c. tea. d. sugar solution.
5. Any solution is composed of a ....
   a. solvent only. b. solute only.
   c. solute and a solvent. d. solute or a solvent.
6. Most mixtures formed by dissolving in liquids are .... mixtures.
   a. homogeneous b. heterogeneous
   c. identical d. (b) and (c)
7. To form a salty solution, we add salt to water with ....
   a. melting. b. evaporation.
   c. stirring. d. (a) and (b).
8. The substance in which solids dissolve is called ....
   a. solubility process. b. solvent.
   c. solute. d. sugar.
9. The solute in chocolate-milk solution is (are) ....
   a. milk. b. chocolate.
   c. water. d. all the previous answers.
10. The substance that dissolves in liquid is called ....
    a. solubility process. b. solvent.
    c. solute. d. no correct answer.

11. The solute in a salty solution is ....
   a. sugar. b. salt. c. water. d. milk.
12. .... results from the solubility of a solute in a solvent.
   a. Mixture b. Stirring c. Liquid d. Solution
13. The solubility time is decreased by ....
   a. increasing the stirring process.
   b. increasing the temperature.
   c. increasing the amount of solvent.
   d. all the previous answers.
14. Solubility process depends on ....
   a. temperature. b. type of solute.
   c. stirring. d. all the previous answers.
15. All these factors affect solubility process except ....
   a. temperature. b. colour of solvent.
   c. stirring. d. type of solute.
16. .... is a common solvent as thousands of materials dissolve in it.
   a. Water b. Alcohol c. Vinegar d. Benzene
17. When temperature increases during solubility, the solubility time ....
   a. decreases. b. increases.
   c. doesn't change. d. no correct answer.
18. Grinding the sugar cubes ....
   a. increase the speed of solubility. b. decreases the speed of solubility.
   c. decreases the amount of solvent. d. prevents the solubility process.
19. The time needed to dissolve sodium chloride in water differs from that needed to dissolve sodium carbonate in the same amount of water. This means that ....
   a. solubility process depends on the kind of solvent.
   b. solubility process depends on heating.
   c. solubility process depends on the kind of solute.
   d. solubility process increases by stirring.
20. Increasing the quantity of a solvent when using the same amount of solute leads to ....
   a. increase in the solubility time.
   b. decrease in the solubility time.
   c. no change in the solubility time.
   d. no correct answer.

2. Put (✓) in front of the correct statement and (×) in front of the incorrect one, then correct it:

1. Mixture of sugar in water is a heterogeneous liquid mixture. ( )
2. The solution is composed of a solute and a solvent. ( )
3. Water in sugary solution is the solute. ( )
4. Solubility is the process by which the solute dissolves in the solvent leading to the disappearance of the solute. ( )
5. Salt is the solvent in a salty solution. ( )
6. Adding insoluble substance to a certain solvent forms a homogeneous mixture. ( )
7. Solvent is a liquid used to dissolve the solid material in it. ( )
8. The solubility time increases as the amount of the solvent decreases. ( )
9. As the temperature increases, the solubility time increases. ( )
10. As stirring increases, the solubility time decreases. ( )
11. Temperature, stirring and the type of solute are from the factors affecting the solubility process. ( )
12. Solubility speed decreases by shaking and rising the temperature. ( )
13. The solubility speed of solids increases by grinding. ( )
14. Solute + Solvent $\xrightarrow[\text{process}]{\text{solubility}}$ Solution. ( )
15. Apple juice is a suspension, while orange juice is a solution. ( )
16. The solubility time of 30 gm. of salt in 100 ml. of water is longer than that needed to dissolve 50 gm. of salt in the same amount of water. ( )
17. The substance that suspends in a certain solvent is called soluble in that solvent. ( )

3. Write the scientific term of each of the following:

1. The liquid used to dissolve the solid substances. (..............)
2. The solid substance that dissolves in a solvent. (..............)
3. The material at which the solute disappears. (..............)
4. The liquid mixture which is composed of a solute and a solvent. (..............)
5. The mixture of insoluble solid substance (mud) in water. (..............)
6. The homogeneous liquid mixture that is made by mixing two or more different substances. (..............)
7. The mixture whose components can't be distinguished from each other. (..............)

8. A mixture whose components can be distinguished from each other. (...............)
9. The substance in which the solute disperses. (...............)
10. A mixture in which the solute breaks down into its most basic particles that spread throughout the solvent. (...............)
11. A process needs the presence of a solvent and a solute. (...............)
12. A process by which a solute dissolves in a solvent leading to the disappearance of the solute. (...............)

4. Complete the following statements:

1. There are two types of mixtures which are .... and ....
2. The solution is a type of ....
3. .... is a homogeneous liquid mixture.
4. .... is the mixture whose components can't be distinguished from each other.
5. The components of .... mixtures can be distinguished, while the components of .... mixtures can't be.
6. Heterogeneous liquid mixtures are called ....
7. .... , ... and .... are homogeneous liquid mixtures.
8. Natural orange juice and .... are heterogeneous liquid mixtures.
9. The solution consists of .... and .... which are mixed by .... process.
10. The substance which dissolves in a liquid is called ....
11. The substance in which the solute dissolves is called ....
12. The process by which a solute dissolves in a solvent is known as ....
13. .... + ... $\xrightarrow[\text{...........}]{\text{...........}}$ Solution.
14. In salty solution, salt is the ...., while water is the ....
15. .... is considered to be a general solvent, because of its ability to dissolve most materials.
16. From the factors affecting the solubility process .... and ....
17. Mixing a small amount of mud with water forms .... that can be separated by ....
18. On adding insoluble substance in a certain solvent, ... is formed.
19. .... is a mixture in which the particles of the solute are suspended throughout the solvent.

20. Increasing the quantity of solvent, ... the solubility time when using the same amount of solvent and solute.
21. Increasing ...., reduces the solubility time.
22. Increasing temperature, ... the solubility time when using the same amount of solvent and solute.
23. The time required to dissolve a quantity of sugar in hot water is .... than that required to dissolve the same quantity in cold one.
24. The speed of solubility .... by increasing stirring process.
25. The solubility time that is needed to dissolve 10 gm. of table salt .... that required to dissolve 10 gm. of sodium carbonate.
26. The best conditions to decrease the solubility time are .... , ... and ....

5. Give reasons for the following:

1. Solution is a type of mixtures.
....
2. There are different types of mixtures.
....
....
3. Tea and sugary solution are homogeneous liquid mixtures (solutions).
....
4. Mud in water is a heterogeneous mixture.
....
5. Water is considered a common solvent.
....
6. In chocolate-milk, chocolate is considered the solute.
....
7. The solubility speed depends on the temperature of the solution.
....
8. The time of dissolving sodium chloride in water differs from that of dissolving sodium carbonate in the same amount of water.
....
9. Dissolving 20 gm. of table salt in 200 ml. of water is faster than dissolving 50 gm. of table salt in the same amount of water.
....

10. Dissolving sugar in hot tea is easier than that in cold lemonade.

....

11. Dissolving salt in heated water is faster than that in cold water.

....

12. We prefer putting powdered sugar than cubes of sugar in tea.

....

13. • It is better to dissolve sugar in water by heating and stirring.
• The dissolving time of any soluble solid substance in a liquid decreases by stirring and heating.

....

....

14. Salt dissolves easily and faster in a large amount of water.

....

6. Which of the following processes takes place faster than the other and why?

1. Dissolving a quantity of table salt in hot water
or dissolving the same quantity of table salt in cold water.

....

....

2. Dissolving a quantity of sugar in water with stirring
or dissolving the same quantity of sugar in the same quantity of water without stirring.

....

....

3. Dissolving an amount of salt in 100 ml. of water
or dissolving the same amount of salt in 300 ml. of water.

....

....

4. Grinding of solids before adding them to a liquid to dissolve
or breaking them down into small pieces.

....

....

5. Dissolving of sugar grains or sugar cubes in water.

....

....

7. What happens when ... ?

1. Adding an insoluble substance to a certain solvent.
   ....
2. The amount of the solvent increases.
   ....
3. The amount of the solute increases.
   ....
4. The temperature of the solution decreases.
   ....
5. Stirring a mixture of salt and water.
   ....
6. Stirring two equal amounts of sugar in two beakers contain unequal amounts of water.
   ....
   ....

8. What is meant by ... ?

1. Solution.
   ....
   ....
2. Solute.
   ....
   ....
3. Solvent.
   ....
   ....
4. Solubility process.
   ....
   ....
5. A homogeneous mixture.
   ....
   ....
6. A heterogeneous mixture.
   ....
   ....
7. Suspension.
   ....
   ....

2
Lesson

9. Mention the difference between:

1. Mixture and solution.

....

....

....

2. A solute and a solvent.

....

....

....

3. The homogeneous and the heterogeneous mixture.

....

....

....

4. The solution and the suspension.

....

....

....

5. A soluble substance and an insoluble substance.

....

....

....

10. How does temperature affect the solubility process?

....

11. What are the factors affecting the solubility process?

....

....

....

12. Complete the following table:

Solution	Solute	Solvent
1. Tea solution with sugar.	....	....
2. Lemon juice with sugar.	....	....
3. Baking soda solution.	....	....
4. Sodium carbonate solution.	....	....
5. Salty solution.	....	....

13. **Look at the opposite figures, then mention your observation and your conclusion.**

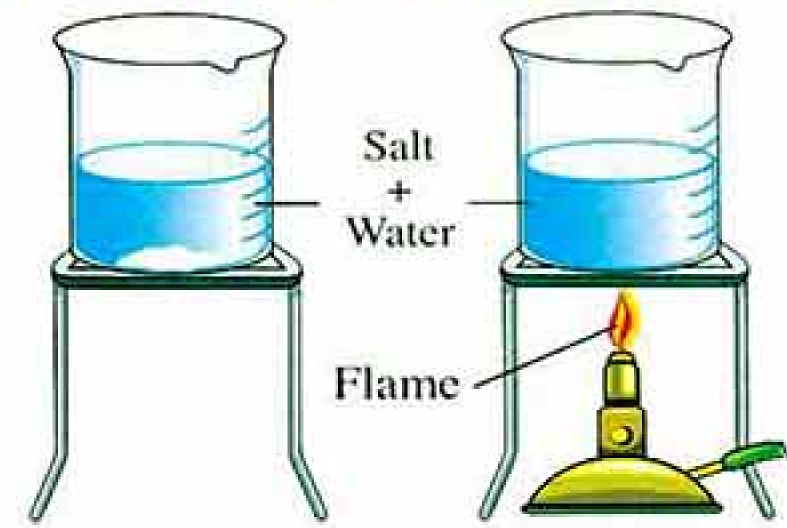


Fig. (a) Fig. (b)

1. a. Observation:

....

....

b. Conclusion:

....

....

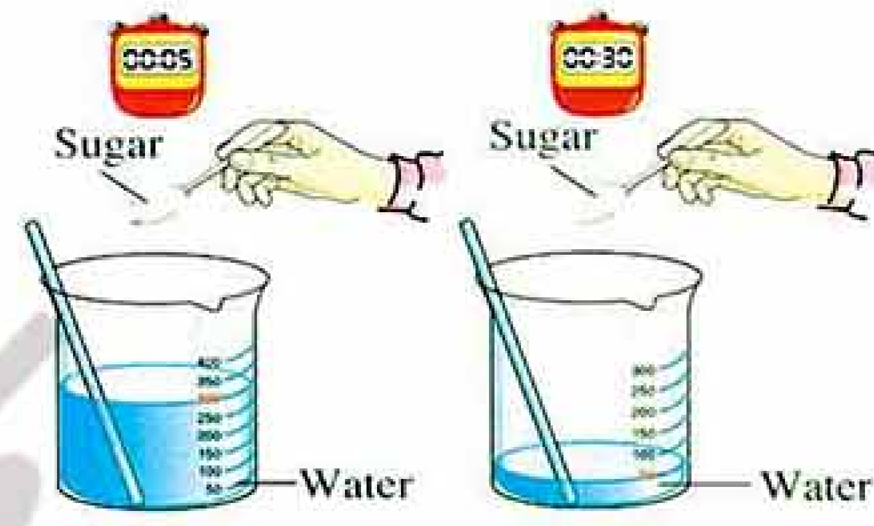


Fig. (a) Fig. (b)

2. a. Observation:

....

....

b. Conclusion:

....

....



Fig. (a) Fig. (b)

3. a. Observation:

....

....

b. Conclusion:

....

....

14. **Look at the opposite figures, then answer the following:**

1. Which beaker contains sodium carbonate solution and which contains sodium chloride solution ?

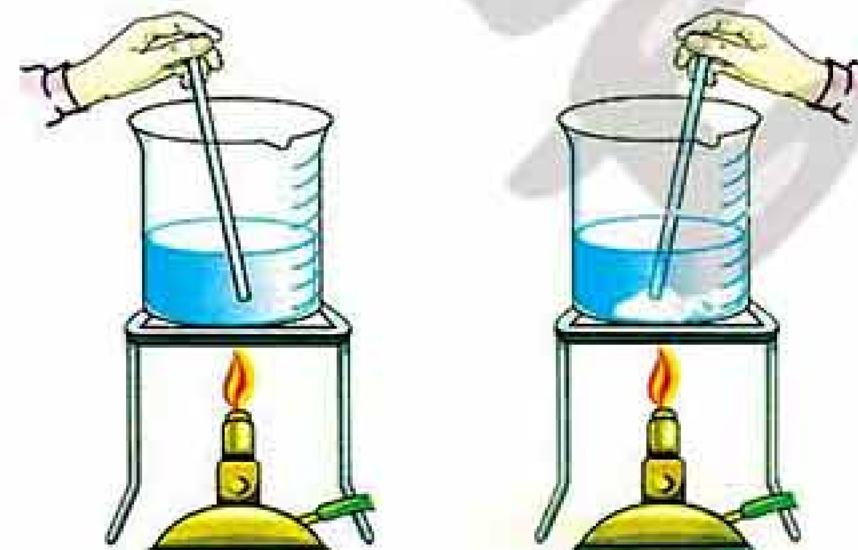
....

....

2. Conclusion:

....

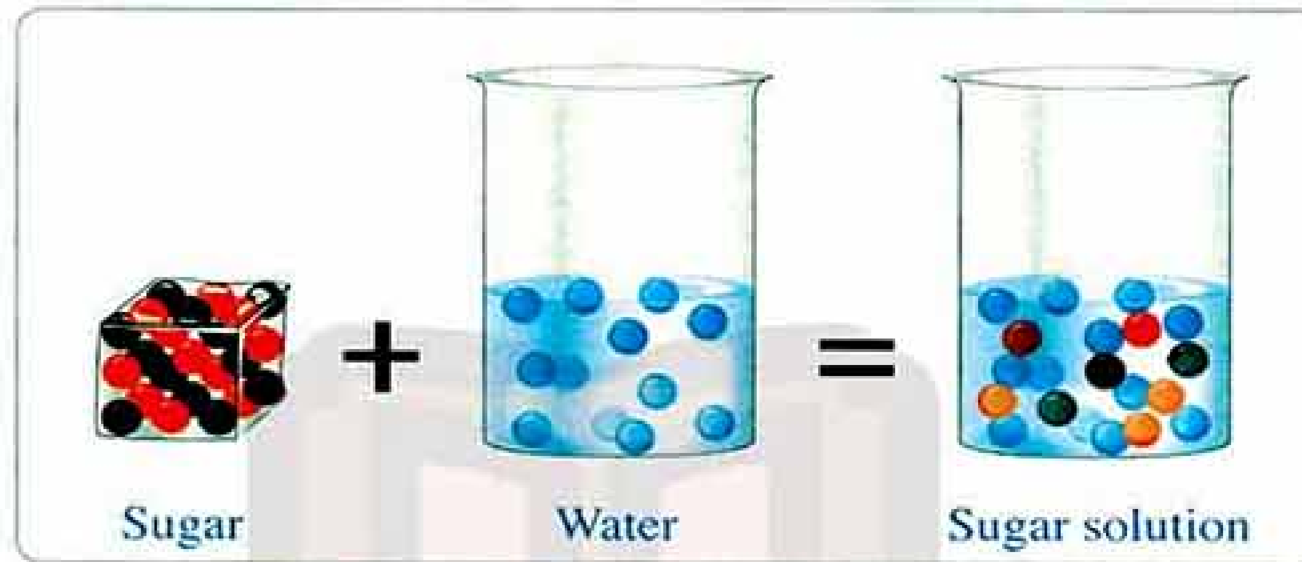
....


Fig. (a) Fig. (b)

Timss Questions



1. Look at the following equation, then answer the following questions:





A. What is the name of this process ?

....

B. When we use sugar as cubes not powder, the solubility time ....

C. When we use a small amount of water and a large amount of sugar, the solubility speed ....

D. When we ...., the solubility process increases.

a. stir this mixture
b. heat this mixture
c. put this mixture in the fridge
d. (a) and (b)

2. Amir and Soha try to make a solution. They have two beakers contain the same amount of tap water. They have 5 gm. of sodium chloride and 5 gm. of sodium carbonate. Answer the following question :

a. Which solution will be formed faster ?

....

b. When we use a glass rod to stir the solution? Which solute will dissolve faster ?

....

3. Shaded the examples below that represent the solvent:

Oil	Sand	Alcohol	Sodium chloride
Cheese	Vinegar	Chocolate	Benzene
Water	Wax	Milk	Apple juice

Environmental Balance

UNIT THREE

Lessons of the unit :

1. Food relationships among living organisms.
2. Environmental balance.

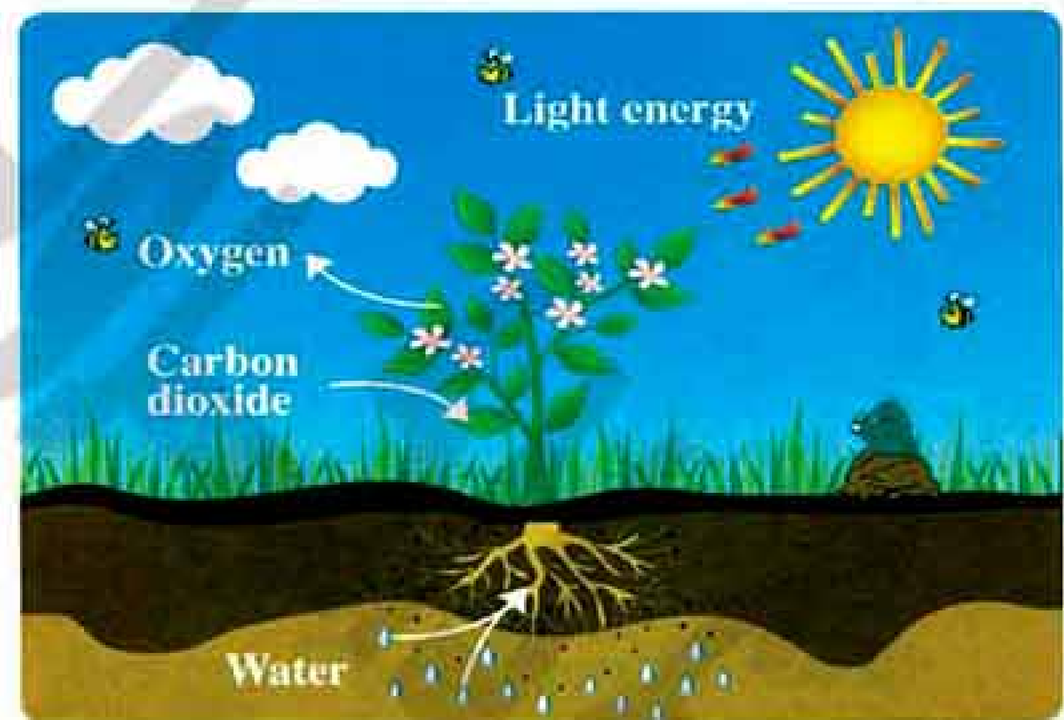
Unit Objectives : By the end of this unit, you will be able to :

- Identify food relationships among living organisms.
- Give examples of predation in plants and animals.
- Identify some ways of self-defence against predation in living organisms.
- Identify examples of commensalism among living organisms.
- Identify examples of symbiosis among living organisms.
- Give examples of some parasites.
- Identify the harms affecting the hosts as a result of parasitism.
- Give examples of decomposers.
- Recognize the predation effect on the environmental balance.
- Define the effect of decomposers on the environmental balance.



Lesson 1 Food relationships among living organisms

- Food is the main source of energy for all living organisms, where:



- Green plants make their own food during photosynthesis process from simple substances:

1. Carbon dioxide gas and water.
2. Sunlight as a source of energy.

SO, green plants are called producers (autotrophic organisms).

- Some animals depend on plants directly, so these animals are called herbivorous such as rabbit, sheep ... etc.
- Some other animals depend on plants indirectly, so these animals are called carnivorous such as lion, snake ... etc.
- So, there are many food relationships among living organisms.

Types of food relationships

1. Predation
2. Symbiosis
3. Saprophytism

autotrophic	ذاتى التغذية	saprophytism	الترمم	directly	مباشر	relationship	علاقة	carnivorous	أكل للّحم
predation	إفتراس	symbiosis	المعايشة	indirectly	غير مباشر	herbivorous	آكل للعشب		

Predation

Predation:

It is a food relationship among living organisms, where one living organism devours another one.

- Predation occurs between two living organisms :
  1. **The predator** which devours the other living organism.
  2. **The prey** which is the devoured living organism.
- Predation is a temporary relationship. G.R.
  Because it ends by devouring the prey or a part of it, where the predator attacks, kills or devours the prey.
- Predation occurs in plant world and animal world.

First Predation in plants

- Predation is less common in plant world than that in animal world. G.R.
  Because plants can make their own food (carbohydrates and protein) by photosynthesis process.
- Some plants cannot make protein, because they cannot absorb some compounds from the soil.

SO, they prey some tiny animals as insects to get their required elements for making protein and these plants are known as **insect-eaters (insectivorous) plants**.

WWW 10

Examples :


Drosera


Dionaea

carbohydrates	كربوهيدرات	attack	هجوم	devour	يلتهم	tiny	صغيرة جداً
insectivorous	آكل الحشرات	prey	فريسة	predator	مفترس		

1
Lesson

G.R.

Drosera is an insectivorous plant.

Because it preys some insects to get the required elements for making protein.

Second Predation in animals

Examples :

A lion preys a deer.



A wolf preys a rabbit.



Predation in animals



A cat preys a rat.



Spiders, where they make woven to catch insects.

SO, lions, tigers, spiders, wolves, cats, snakes and sharks are considered as predator animals.

Exercise

Complete the following sentences :

1. *Predation is less common in .... world than that in .... world.*
2. *............... and .... are examples of insectivorous plants.*
3. *The devoured animal is known as ....*

sharks أسماك القرش woven نسيج wolf ذئب spider عنكبوت

Some ways of self-defence against predation in living organisms

Many living organisms have (appeal to) different ways of defending themselves against enemies such as:

A. Camouflage. **B.** Mimicry.

A Camouflage

Camouflage:

A phenomenon in which living organism protects itself (hides) from enemies by changing its colour to simulate the colours of its surrounding environment.

This phenomenon is found in fish, frogs, birds, chameleon and most insects as butterflies.

Examples :

Examples of camouflage

A butterfly stands on a tree with the similar colours.



A frog changes its colour to hide from its enemies.





A chameleon simulates the colour of the surrounding environment.



A cuttlefish (sepia) ejects a black fluid in the surrounding water to hide when attacked by enemies.

cuttlefish	الحبار	enemies	أعداء	phenomenon	ظاهرة	chameleon	الحرباء
appeal to	تلجأ إلى	hide	يختبئ	camouflage	الخداع/التمويه	simulate	يماثل
mimicry	التنكر	self-defence	دفاع عن النفس				

1
Lesson

G.R.

A chameleon simulates the colour of the surrounding environment.

To protect itself (hide) from its enemies.

B Mimicry

Mimicry:

A phenomenon in which the harmless living organisms imitate other harmful or poisonous living organisms to frighten their enemies and escape from them.

Example :

Some bees look like wasps in forming lines (stripes) on their bodies to frighten their enemies.


A bee looks like a wasp

G.R.

Some bees look like wasps in forming lines (stripes) on their bodies.

To frighten their enemies which get afraid of wasps and escape from them.



Question

Choose the correct answer:

1. Which of the following organisms protects itself by camouflage phenomenon ? ....

a. Drosera. *b. Chameleon.* *c. Dionaea.* *d. Lion.*

2. .... is a temporary food relationship which ends up by devouring the prey or a part of it.

a. Mimicry *b. Camouflage* *c. Predation* *d. Parasitism*

Answer

1. b. Chameleon. *2. c. Predation*

harmful	ضار	harmless	غير ضار	stripes	خطوط	wasp	دبور
escape	يهرب	poisonous	سام	imitate	يقلد / يشبه	frighten	يُخيف

Symbiosis

It is a common food relationship between two different types of living organisms.

Types of Symbiosis

- **A** Mutualism
- **B** Commensalism
- **C** Parasitism

A Mutualism

Mutualism:

It is a food relationship in which each organism gets benefit (in the form of food) from the other.

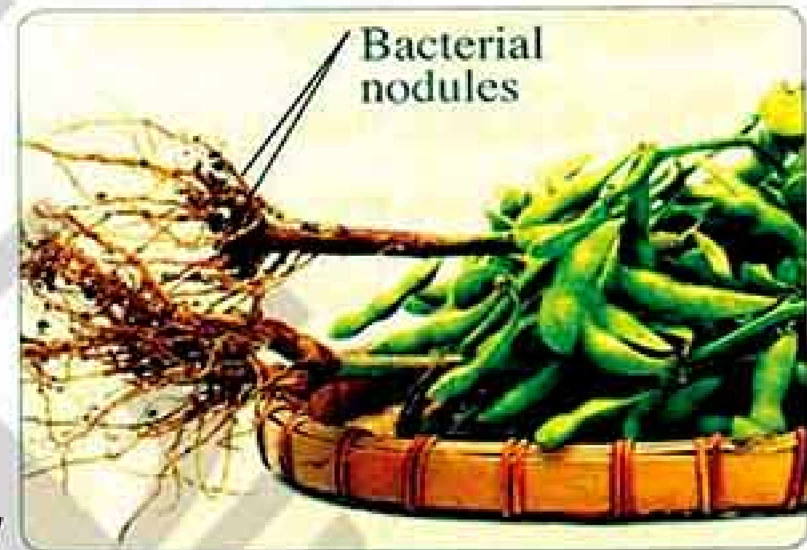
Example :

The relationship between nodular bacteria and leguminous plants (as beans):

Each of them gets benefit from the other in the form of food, where:

a. Nodular bacteria fix nitrogen in an inorganic form to provide the plant with it.

b. The plant provides bacteria with sugar made by the plant during photosynthesis process.



Roots of bean plant

Do you know ?

The benefits of mutualism in human body:

There are several kinds of bacteria that coexist with man, where each of them benefits from the other as follows:

- Human body benefits from bacteria as:
  - Some types of bacteria live inside man's intestine and change some food remains into vitamin (B).
  - Some live on his skin and work on increasing the immunity of skin against diseases infection.

inorganic	غير عضوى	leguminous	بقوليات	mutualism	تبادل منفعة
commensalism	الإفادة	parasitism	التطفل	infection	عدوى
man's intestine	أمعاء الإنسان	coexist	يتواجد مع		

1 Lesson

- Bacteria benefit from man in the previous case as the human body provides bacteria with food and shelter.



Try to answer Test yourself 13

B Commensalism

Commensalism:

It is a food relationship between two living organisms where, one of them benefits from the other, while the other neither gets benefit (in the form of food) nor is harmed.

Example :

The relationship between sponge and tiny aquatic living organisms :

- Tiny aquatic living organisms get food and shelter from the canals and fissures that are found inside the sponge, while the sponge neither gets food (benefit) nor is harmed.



Fissures and canals of sponge



Question

Complete the following:

1. Food relationship in which each organism gets benefit from the other and is not harmed is known as ....

2. .... , ... and .... are the types of symbiosis.

3. Food relationship between nodular bacteria and leguminous plants is ....

4. Food relationship between sponge and some tiny aquatic organisms is ....

Answer

1. mutualism. *2. Mutualism – commensalism – parasitism*

3. mutualism. *4. commensalism.*

aquatic	مائى	fissures	شقوق	sponge	أسفنج
canals	قنوات	shelter	مَسْكن / مأوى		



C Parasitism

Parasitism:

It is a food relationship between two different kinds of living organisms, where one benefits from the other and is known as the parasite, while the other is harmed and is known as the host.

Parasitism causes weakness to the host but it doesn't kill it.

Types of parasitism:

1. External parasitism.
2. Internal parasitism.

1 External parasitism

In this type of parasitism:

- The parasite lives externally on the host's body and feeds by sucking the blood of the host.
- A parasite conveys diseases to the host.

Examples :

Mosquitoes - lice - fleas - bugs - ticks - jawless lamprey (that sucks fish's blood).


Mosquito


Jawless lamprey


Bug

2 Internal parasitism

In this type of parasitism:

The parasite lives internally inside the host's body and shares the host its digested food or feeds on its cells and tissues.

parasite	طفيل	jawless	عديمة الفكوك	lice	القمل	convey	ينقل
internal	داخلى	host	المُضيف (العائل)	bugs	البَق	fleas	البراغيث
mosquitoes	الناموس	sucking	إمتصاص	external	خارجى	digested food	غذاء مهضوم
ticks	قراد	tissues	أنسجة	weakness	ضعف		

1
Lesson

Examples :

Bilharzia worms - ascaris worms - tape worms - filaria worms - liver worms.


Bilharzia worms


Ascaris worms


Tape worm

Harms of parasitism:

Parasites cause many diseases to man such as:

1. Filaria worm causes elephantiasis disease as shown in the figure.
2. Mosquitoes cause malaria disease.
3. Fleas can convey small pox disease to man.
4. Bilharzia worms cause bilharziasis disease.
5. Ascaris worms cause anaemia.


Elephantiasis disease

G.R.

The death of the host is considered a loss to the parasite.

Because parasite will lose its source of food and shelter.

Do you know ?

1. Some dogs, cats and birds which we have at home can be hurt by worms and some of these worms can infect human.
2. To protect man and these living organisms, follow the proper way of cleaning and visit the veterinaries regularly to check them.

liver worm	دودة كبدية	elephantiasis	مرض قدم الفيل	small pox	مرض الجدرى
bilharziasis	مرض البلهارسيا	filaria worm	دودة الفلاريا	hurt	أذى / ضرر
follow	أتبع	proper way	الطريقة الصائبة	veterinaries	الأطباء البيطريون
malaria	مرض الملاريا	tape worm	دودة شريطية	ascaris worm	دودة الإسكارس

Saprophytism

Saprophytism:

It is a food relationship in which saprophytes (decomposers) get their food by decomposing food remains or bodies of dead organisms.

Examples :


Mushroom fungus


Bread mold fungus


Penecillium fungus that decomposes orange fruits

Activity 1 To show how saprophytic organisms (saprophytes or decomposers) get their food.

Steps:

1. Splash some water drops on a slice of bread.
2. Put the splashed bread in a plastic sac and close it firmly.
3. Leave it in a quite dark place for two weeks.

Caution: Don't open the sac or inhale the air inside it and wash your hands after performing the activity.

Observation:

A dark green layer is formed on the bread, so the bread gets rotten.

Explanation:

Saprophytic organisms as bread mold fungus get their food by decomposing the food remains (as moist bread) causing the dark green layer on bread.

Inference :

Saprophytes as bread mold fungus get their food by decomposing food remains.

splash	يرش	slice	شريحة	penecillium fungus	فطر البنسيليوم
quite dark	ظلام تام	rotten	متعفن	firmly	بإحكام
saprophytes	كائنات مترممة	decomposers	كائنات مُحلله	mushroom fungus	فطر عيش الغراب
bread mold fungus	فطر عفن الخبز	moist bread	خبز رطب		

Remember



- There are three types of food relationships between living organisms :

1. Predation. 2. Symbiosis. 3. Saprophytism.

1. Predation :

- Predation is less common in plant world than that in animal world.
  A. In plants such as : Drosera - dionaea.
  B. In animals such as : Lion and deer - wolf and rabbit - cat and rat - spiders and insects.

- Some ways of self-defence against predation :

A. Camouflage such as : Fish - frog - chameleon.
B. Mimicry such as : Bees.

2. Symbiosis:

- Types of symbiosis:

A. Mutualism such as : Nodular bacteria and leguminous plants.
B. Commensalism such as : Sponge and tiny aquatic living organisms.
C. Parasitism.

- Types of parasitism :

A. External parasitism such as : Lice - bugs.
B. Internal parasitism such as : Bilharzia worms - tape worms.

- Harms of parasitism or parasites:

1. Filaria worms cause elephantiasis disease.
2. Mosquitoes cause malaria disease.
3. Fleas cause small pox disease.
4. Bilharzia worms cause bilharziasis disease.
5. Ascaris worms cause anaemia.

3. Saprophytism :

- Saprophytes such as :

Mushroom fungus - bread mold fungus - penecillium fungus.

Try to answer Test yourself 14



Questions on lesson one

Questions signed by  have been taken from the school book.



1. Choose the correct answer:

1. The process of photosynthesis is done by a ....
   a. producer organism. b. consumer organism.
   c. decomposer organism. d. lion.
2. The animal which devours another animal is called ....
   a. parasite. b. host. c. prey. d. predator.
3. The devoured animal by another animal is known as ....
   a. saprophyte. b. parasite. c. prey. d. predator.
4. Predation is a .... relationship.
   a. continuous b. temporary c. permanent d. strong
5. Predation is less common in plant world than in animal world, because plants are .... organisms.
   a. saprophytic b. autotrophic c. parasitic d. symbiotic
6. .... is an insect-eater plant.
   a. Ascaris b. Bean c. Drosera d. Mushroom
7. In food relationship between lion and deer, the lion is a ....
   a. predator. b. prey. c. host. d. parasite.
8. The .... can simulate the colour of the surrounding environment.
   a. bee b. crocodile c. ascaris worm d. chameleon
9. The .... ejects a black fluid in the surrounding water when attacked by an enemy.
   a. frog b. cuttlefish c. butterfly d. chameleon
10. The .... can change its colour to hide from its enemies.
    a. frog b. ascaris worm c. bee d. spider
11. .... is (are) from the way(s) of self-defence against predation in living organisms.
    a. Camouflage b. Mimicry
    c. Commensalism d. (a) and (b)
12. .... is the phenomenon in which a harmless living organism imitates other harmful living organism.
    a. Mimicry b. Symbiosis c. Camouflage d. Mutualism

1 Lesson

13. .... is a food relationship between two organisms, both of them get benefit from the other.
a. Symbiosis b. Mutualism c. Parasitism d. Mimicry

14. The relationship between nodular bacteria and bean plant is ....
a. predation. b. parasitism. c. mutualism. d. mimicry.

15. In mutualism nodular bacteria fix .... in an inorganic form to provide legumes with it.
a. phosphorus b. sulphur c. magnesium d. nitrogen

16. .... is the food relationship between sponge and the tiny aquatic organisms.
a. Mutualism b. Commensalism c. Predation d. Parasitism

17. In the parasitism relationship, the organism which is harmed is called the ....
a. parasite b. prey.
c. host. d. commensal organism

18. In parasitism, the death of the host is considered a .... to the parasite.
a. gift b. loss c. reward d. nothing

19. Bilharzia worms are considered as ....
a. producers. b. parasites. c. decomposers. d. preys.

20. The jawless lamprey feeds by sucking blood of its host which is a ....
a. frog. b. fish. c. insect. d. worm.

21. All the following are external parasites except ....
a. lice. b. ticks. c. lamprey. d. liver worm.

22. All the following are internal parasites except ....
a. lamprey. b. ascaris. c. filaria worm. d. bilharzia worm.

23. Elephantiasis disease infects man as a result of .... worm.
a. ascaris b. filaria c. bilharzia d. liver

24. Mosquitoes cause .... disease to man.
a. elephantiasis b. small pox c. malaria d. bilharziasis

25. .... is the food relationship in which an organism gets its food by decomposing food remains or bodies of dead organisms.
a. Saprophytism b. Parasitism
c. Camouflage d. Mimicry

26. Saprophytes are ....

a. parasitic organisms.
b. autotrophic organisms.
c. decomposer organisms.
d. (a), (b) and (c).

2. Put (✓) in front of the correct statement and (×) in front of the incorrect one, then correct it :

1. Plants are the main source of food on the Earth. ( )
2. The food relationships are classified into predation and saprophytism only. ( )
3. The commensalism relationship ends by killing one organism or devouring a part of it. ( )
4. Predation is a temporary food relationship between predator and prey. ( )
5. Lions, tigers and sharks are predators. ( )
6. Spiders use their woven nets for catching insects. ( )
7. In mimicry, living organisms protect themselves by changing their colour to simulate the colours of the surrounding environment. ( )
8. Some living organisms can change their colour to simulate the colours of the surrounding environment to hide from their enemies. ( )
9. In camouflage, harmless living organisms imitate other harmful or poisonous living organisms to frighten their enemies. ( )
10. Mutualism and commensalism are two types of symbiosis. ( )
11. The food relationship in which each organism gets benefit from the other is known as symbiosis. ( )
12. Commensalism is the relationship between nodular bacteria and leguminous plants. ( )
13. Mutualism is a food relationship in which one organism benefits from the other which neither gets benefit nor is harmed. ( )
14. Mutualism causes weakness to the host but it doesn't kill it. ( )
15. Lice, bugs, fleas and lamprey are external parasites. ( )
16. Internal parasites feed by sucking the host's blood. ( )
17. Bilharzia worm, tape worm and ascaris worm are external parasites. ( )
18. The relation between filaria worm and man is a parasitism relationship. ( )
19. Mosquitoes infect man with elephantiasis. ( )

20. In saprophytism, saprophytes feed by decomposing bodies of dead organisms. ( )
21. Bread mold fungus, mushroom and penecillium are saprophytes. ( )
22. Among the different types of fungi, mushroom which makes its food. ( )
23. Fungi which are feeding on the dead organisms bodies are called saprophytes. ( )

3. Write the scientific term of each of the following:

1. The main source of energy for all living organisms. (..............)
2. The living organisms which make their food from simple substances. (..............)
3. The temporary food relationship that ends by devouring the prey or a part of it. (..............)
4. A food relationship at which a living organism feeds on other living organism. (..............)
5. The animal which devours the other animal in the predation relationship. (..............)
6. The devoured animal in the predation relationship. (..............)
7. The plants that devour tiny insects. (..............)
8. The food relationship between a lion and a deer. (..............)
9. The phenomenon in which a living organism protects itself from enemies by changing its colour to simulate its surrounding environment. (..............)
10. A living organism which ejects a black fluid in the surrounding water to hide when attacked by enemies. (..............)
11. The phenomenon in which a harmless living organism imitates other harmful or poisonous living organism to frighten its enemies. (..............)
12. The food relationship between two organisms that benefit from each other. (..............)
13. The relationship between nodular bacteria and leguminous plants as beans. (..............)
14. Bacteria fix nitrogen in an inorganic form to provide the leguminous plants with nitrogen. (..............)
15. The food relationship, in which one organism benefits from the other and the other neither gets benefit nor is harmed. (..............)
16. The relationship between sponge and the tiny aquatic living organisms. (..............)

17. The food relationship in which one organism benefits from the other, whereas the other is harmed. (..................)
18. The organism that benefits from other organism in parasitism relationship. (..................)
19. The organism which is harmed from other organism in parasitism relationship. (..................)
20. The food relationship that causes weakness to the host. (..................)
21. A kind of parasites that may live on the host's body to get its food. (..................)
22. The worm which infects man with elephantiasis disease. (..................)
23. The parasite which causes malaria disease to man. (..................)
24. The external parasites which convey small pox disease to man. (..................)
25. The parasitic worm that causes bilharziasis disease. (..................)
26. The disease caused by the parasitic ascaris worms. (..................)
27. The food relationship in which the organism gets its food by decomposing the food remains or the bodies of dead organisms. (..................)
28. The organism which feeds by decomposing the moist or wet bread. (..................)
29. The organisms which help in getting rid of dead organisms. (..................)

4. Complete the following statements :

1. Green plants are .... organisms.
2. Types of food relationships between living organisms include predation, ... and ....
3. In predation, the animal that devours the other living organism is known as ...., while the devoured animal is known as ....
4. A temporary food relationship in which one living organism devours another one is known as ....
5. Lion, ... and .... are examples of predators.
6. Predation is less common in .... world than that in .... world.
7. Plants that feed on some insects are known as .... plants, such as .... and ....
8. Some plants prey insects to get their required elements for making ....
9. The interaction between a cat and a rat is considered as an example of .... relationship.

1 Lesson

10. .... and .... are from the ways of self-defence against predation in living organisms.
11. Types of symbiosis are .... , ... and ....
12. During .... phenomenon, the living organism changes its colour to simulate the colours of its surrounding environment.
13. A butterfly stands on a tree with similar colour to hide from its enemies. This method is called ....
14. Bees which look like wasps undergo .... phenomenon to frighten their enemies, while chameleon undergoes .... phenomenon to hide from enemies.
15. Sepia ejects a black fluid in the surrounding environment to ....
16. The food relationship between nodular bacteria and leguminous plants is known as ....
17. The food relationship in which, both organisms get benefit from each other is known as ....
18. The food relationship in which a living organism benefits from the other, while the other neither gets benefit nor is harmed known as ....
19. Tiny aquatic living organisms get .... and .... from the canals and fissures of the sponge.
20. In parasitism relationship, the living organism that benefits from the other is known as .... , while the living organism that is harmed is known as ....
21. In parasitism relationship, the death of the .... is considered a loss to the ....
22. Parasitism is classified into two types which are .... and ....
23. Bilharzia worm hurts .... , so it is called .... , while the organisms that are hurted called hosts.
24. External parasites that suck blood from the body such as .... , while internal parasite such as ....
25. In internal parasitism , the parasites share the hosts .... or feed on their ....
26. In food relationships , the harmed organism is known as .... , while the organism that is devoured is known as ....
27. .... worm infects man causing elephantiasis disease.

28. Fleas can convey .... disease to man, while ascaris worm causes .... to him.
29. Bilharzia worm is an internal ....
30. In saprophytism relationship, the saprophytes get their food by decomposing .... or bodies of ....
31. Fungi are considered as .... living organisms.
32. .... , ... and penecillium are examples of saprophytes.
33. Orange fruits are decomposed by .... fungus.
34. The relationship between fungi and dead organisms is an example of ....

5. Give reasons for the following :

1. Plants are called autotrophic organisms.
....
2. Plants are the main food for lions, although lions are carnivorous.
....
3. Predation is a temporary food relationship.
....
4. Predation is less common in plant world than in animal world.
....
....
5. Some plants cannot make protein although they make their own food.
....
6. • Drosera and dionaea are known as insectivorous plants.
   • Some plants are known as insectivorous plants.
....
....
7. The relation between a wolf and a rabbit is predation.
....
8. Some animals have the ability to camouflage.
....
....
9. A cuttlefish can hide from its enemies.
....

10. The chameleon simulates the colours of the surrounding environment.

11. A butterfly stands on a tree with the similar colour.

12. Sepia ejects a black fluid in the surrounding water when attacked by enemies.

13. Some bees look like wasps in forming lines on their bodies.

14. Some harmless living organisms imitate other kinds of poisonous living organisms.

15. There is a mutualism relationship between nodular bacteria and leguminous plants.

16. There is a commensalism relationship between sponge and tiny aquatic living organisms.

17. Parasitism relationship differs from the predation relationship.

18. Host death is considered a loss to the parasite.

19. The parasite doesn't kill its host.

20. Lice, bugs, mosquitoes and ticks are external parasites.

21. Tape worms, bilharzia and liver worms are internal parasites.

22. Parasitism causes weakness to the host.

23. Saprophytic organisms are decomposers.

....

....

24. Saprophytic organisms feed on the bodies of dead organisms.

....

25. Bread mold, mushroom and penecillium fungi are saprophytes.

....

....

6. What happens when ... ?

1. Food producers (as green plants) are not found.

....

2. A chameleon is attacked by enemies.

....

3. A cuttlefish is attacked by enemies.

....

4. There is no nodular bacteria in the roots of leguminous plants as beans.

....

5. A parasite lives externally on the host's body.

....

6. You splash some water drops on a slice of bread and leave it for two weeks.

....

7. Cross the odd word out :

1. Sunlight – Water – Oxygen – Carbon dioxide. (..............)
2. Cat – Wolf – Rat – Lion. (..............)
3. Chameleon – Butterfly – Cuttlefish – Drosera. (..............)
4. Fleas – Ascaris worm – Tape worm – Bilharzia worm. (..............)

8. Mention the kind of food relationship between each of the following:

1. Lion and deer. (..............)
2. Cat and rat. (..............)
3. Drosera plant and insects. (..............)
4. Nodular bacteria and bean plant. (..............)
5. Sponge and tiny aquatic living organisms. (..............)
6. Bread mold fungus and moist bread. (..............)
7. Fungi and dead organisms. (..............)

8. Jawless lamprey and fish. (..............)
9. Lice and man. (..............)
10. Ascaris worm and man. (..............)
11. Bilharzia worms and man. (..............)

9. Write the benefit of nodular bacteria to bean plant.

....

....

10. Look at the opposite figure , then answer the following questions:



1. What is the food relationship between the plant and the insect ?

....

2. Why does this plant feed on the insects ?

....

11. What is meant by ...?

1. Predation.

....

....

2. Camouflage.

....

....

3. Mimicry.

....

....

4. Mutualism.

....

....

5. Commensalism.

....

....

6. Parasitism.

....

....

7. Saprophytism.

....

....

12. Name the parasite that causes the following diseases:

1. Elephantiasis.

....

2. Malaria.

....

3. Small pox.

....

4. Bilharziasis.

....

5. Anaemia.

....

13. Classify the following organisms into predators, parasites and decomposers:

1. Ascaris worm. (..............)
2. Lion. (..............)
3. Lice. (..............)
4. Snake. (..............)
5. Bread mold fungus. (..............)
6. Jawless lamprey. (..............)

14. Compare between each pair of the following relationships:

1. Commensalism and parasitism.

....

....

2. Parasitism and saprophytism.

....

....

3. External parasitism and internal parasitism.

....

....

15. Choose from column (B) what suits it in column (A) :

(1)

(A)	(B)
1. Predation	a. takes place between man and tape worms.
2. Mutualism	b. takes place between nodular bacteria and bean plant.
3. Commensalism	c. takes place between cat and rat.
4. Saprophytism	d. takes place between sponge and tiny aquatic living organisms.
5. Parasitism	e. takes place between fungi and food remains.

1. .... 2. .... 3. .... 4. .... 5. ....

(2)

(A)	(B)
1. Mosquitoes	a. causes elephantiasis to man.
2. Filaria worm	b. can convey small pox to man.
3. Bread mold fungus	c. cause malaria to man.
4. Fleas	d. causes anaemia to man.
5. Ascaris worm	e. causes the rotten of bread.

1. .... 2. .... 3. .... 4. .... 5. ....

16. Show the type of food relationship illustrated in the following figures:

1. 

....

2. 

....

3. 

....

4. 

....

Timss Questions



1. Use the following photos to answer the following statements:


Fig. (A)


Fig. (B)


Fig. (C)


Fig. (D)

a. When a living organism hides from enemies by changing its colour to simulate the colours of its surrounding environment. This means that appeals to .... phenomenon as in figure ....

b. When a living organism devours another one. This means that appeals to .... phenomenon as in figure ....

c. In figure ...., the bee looks like wasps in forming .... This phenomenon is called ....

d. Figure .... represents commensalism relationship.

2. Classify the following parasites into:

- Parasites convey diseases to the host.
- Parasites share the host its digested food or feed on its cells and tissues.

(Lice - Fleas - Liver worms - Mosquitoes - Bilharzia worms - Bugs - Ticks - Filaria worms - Jawless lamprey - Tape worms)

....

....

3. In front of you, two different food relationships. Mention the name of each one and how each one occurs.

1. 

2. 

....

....

....



Lesson 2 Environmental balance

- The following figures represent natural areas that contain :
• Some living organisms such as lion, elephant , deer and plants.
• Some non-living things such as air, soil ... etc.
- Each one of these natural areas is called "Ecosystem".





Ecosystem

Ecosystem:

It is any natural area including living organisms (as plants and animals) and non-living things (as water, soil and air).

The components of ecosystem:

Any ecosystem consists of two main components which are :

a. Living organisms as plants, fungi, algae and animals.
b. Non-living things as air, soil and water.

environmental balance	التوازن البيئى	algae	طحالب	ecosystem	النظام البيئى
natural area	مساحة طبيعية	including	تحتوى على		

Classification of ecosystems:

Ecosystems may be classified according to their sizes into:

a. Small as an area of land or a water pond.

b. Large as a forest, a desert or an ocean.

c. Very large as the universe that is considered the unified ecosystem.

By looking at the following ecosystem, you will notice that there are many relationships between the components of the ecosystem as:



a. The relationship between plants and the soil , where:
Plants depend on the soil to absorb water and salts that are necessary to make their own food by photosynthesis process.

b. The relationship between plants and animals , where:
Animals feed on plants to get food and energy.

c. The relationship among different animals , where:
Some animals feed on other animals to get food and energy.

When the relationships (interactions) among the components of the ecosystem are stable (balanced), an environmental balance is occured.

among	فيما بين	stable	ثابت/مستقر	pond	بِركة	universe	الكون
balanced	متوازن	interaction	تفاعل	unified	موحد		

2
Lesson

Environmental balance

Environmental balance:

It is the balance among the components of ecosystem.

- The interaction among environmental components is a continuous process.
- This interaction keeps the balance among these components unless a disturbance arises as a result of many factors.

Factors that harm (disturb) the environmental balance:

1 Natural changes

Change in the natural conditions (circumstances) in ecosystem causes a disturbance that leads to:

a. Disappearance of some organisms.

b. Appearance of other organisms.

c. Environmental imbalance, that may take a short or a long period of time until a new balance occurs in this environment.

Example:

In ancient eras, change in the natural conditions of the environment leads to the disappearance of dinosaurs causing their extinction.



Dinosaurs

2 Man interference

- Some human activities lead to the disturbance of the environmental balance.
- Among these human activities :

1. Cutting down trees.
2. Burning forests.
3. Polluting the environment.
4. Eroding the soil.

Example:

Cutting down trees as the green plants (trees) are the main source of food and oxygen for all living organisms.



Cutting down trees

disturbance	إضطراب	interference	تدخل	imbalance	عدم إتزان
eras	عصور	circumstances	ظروف	extinction	إنقراض
eroding	تآكل	cutting down trees	القطع الجائر للأشجار	polluting	تلوث

Factors that keep the environmental balance:

Some food relationships help in keeping the environmental balance such as:

1. Predation.
2. Saprophytism.

1 The effect of predation on keeping the environmental balance

- Predation organizes the numbers of preys' population.

Where,
predators help preys to get rid of weak or sick members and let the strong ones reproduce adding strong members to population.

- If there were no predators in ecosystem, the environmental balance will be disturbed, as :


Increase the number of preys

1. Number of preys will increase to an extent that the available food resources become insufficient (not enough) for preys.
2. Competition appears among preys' population, so preys will die, because they haven't shelter and become weak and feeble (infected with diseases) which lead to their death.



Question

What happens if ... ?

Rabbits are introduced into an island that has a suitable environment with much food and no natural enemies.

Answer

The number of rabbits will increase and competition appears among them to get food, so they will die causing an environmental imbalance.

G.R.

Predation relationship plays an important role in keeping the balance of ecosystem.
Because the predation relationship organizes the numbers of preys' population.

reproduce	تتكاثر	population	مجتمع	extent	درجة/حد
competition	منافسة	organize	يُنظم	island	جزيرة
insufficient	غير تدوير	role	دور		



2 Lesson

2 The effect of saprophytism (saprophytic organisms) on keeping the environmental balance

- **The saprophytic organisms (decomposers) as bacteria and fungi help the environment in:**
  a. Getting rid of the bodies of dead organisms by decomposing them.
  b. Recycling the chemical elements found in the bodies of dead organisms (as carbon, nitrogen and phosphorus) to the environment, to make other living organisms benefit from them.
- **If there were no saprophytes in ecosystem, the environmental balance will be disturbed as:**
  1. The Earth's surface will be covered with the bodies of dead organisms.
  2. Chemical elements found in the bodies of dead organisms will not be recycled to the environment, so the other living organisms can't get benefit from these elements.

Note 

Man can benefit from saprophytic organisms in many industries such as:



a. Food industry : Some saprophytic organisms are used in making some types of food such as cheese, bread, yoghurt, vinegar and alcohol.



b. Drugs industry : Some saprophytic organisms are used in manufacturing some drugs (medicines) such as antibiotics.



c. Leather tanning industry : Some saprophytic organisms are used in tanning of natural leather.

yoghurt	زبادى	antibiotics	مضادات حيوية	alcohol	الكحول
drugs	أدوية	phosphorus	الفوسفور	leather tanning	دباغة جلود
recycling	إعادة تدوير			manufacturing	صناعة

Remember



Ecosystem:

It is any natural area including living organisms (as plants and animals) and non-living things (as water, soil and air).

The components of ecosystem:

1. Living organisms as plants and animals.
2. Non-living things as air and soil.

Ecosystem can be classified into:

1. Small as water pond.
2. Large as forest, desert or an ocean.
3. Very large as the universe.

Environmental balance:

It is the balance among the components of the ecosystem.

Factors that harm the environmental balance are:

1. Natural changes.
2. Man interference.

Factors that keep the environmental balance are:

1. Predation.
2. Saprophytism.

Benefits from saprophytic organisms industries such as:

1. Food industry.
2. Drugs industry.
3. Leather tanning industry.

Try to answer :
* Test yourself 15
* General exercise of the school book on unit 3
* Model Exams on unit 3



Questions on lesson two



1. Choose the correct answer:

1. All the following are components of ecosystem except the ....
   a. animals. b. soil. c. plants. d. stars.
2. Ecosystem is any .... area including living organisms and non-living things.
   a. natural b. artificial c. deep d. (a) , (b) and (c)
3. All the following are living organisms of an ecosystem except the ....
   a. insects. b. plants. c. air. d. birds.
4. All the following are the components of the ocean ecosystem except ....
   a. fish. b. dolphins. c. deers. d. sharks.
5. Which of the following is a very large ecosystem ? ....
   a. The ocean. b. The water pond.
   c. The desert. d. The universe.
6. All the following are large ecosystems except the ....
   a. desert. b. water pond. c. forest. d. sea.
7. Introducing rabbits into an island that is a suitable environment with much food and no enemies will lead to the environmental ....
   a. balance. b. imbalance. c. equilibrium. d. growth.
8. The balance among the components of the ecosystem is known as the ....
   a. environmental balance. b. saprophytism.
   c. natural balance. d. predation.
9. Cutting trees to build houses causes the environmental ....
   a. balance. b. disturbance. c. envelope. d. camouflage.
10. The interaction among the components of the environment is a / an .... process.
    a. disturbed b. variable c. imbalanced d. continuous
11. All the following cause a disturbance to the environmental balance except ....
    a. cutting down trees. b. natural changes.
    c. disappearance of organisms. d. saprophytes.

12. After the occurrence of environmental imbalance for a long or a short period of time, a new .... will take place.
   a. disturbance b. imbalance c. balance d. change
13. In the ancient eras, the .... led to the extinction of dinosaurs.
   a. appearance of new organisms
   b. disappearance of organisms
   c. man interference
   d. changing of natural circumstances
14. Interaction among environmental components leads to keep the environmental ....
   a. change. b. balance. c. disturbance. d. imbalance.
15. Predation relationship .... the numbers of the preys in populations.
   a. increases b. organizes c. decreases d. prevents
16. .... is an example of extinct animals due to the change in natural conditions in the environment.
   a. Dinosaur b. Tiger c. Lion d. Insect
17. If there were no predators, preys' populations would ....
   a. increase in number. b. become weak.
   c. die. d. all the previous answers.
18. Due to the shortage of food resources, ... appears among preys' populations.
   a. predation b. symbiosis c. competition d. mutualism
19. Predation relationship plays an important role in organizing .... in the ecosystem.
   a. preys numbers b. shelters
   c. food resources d. saprophytes numbers
20. From decomposer organisms ....
   a. fungi. b. plants. c. rabbits. d. lions.
21. Saprophytic organisms .... the chemical elements within the ecosystem.
   a. provide b. save c. keep d. recycle
22. Without the saprophytic organisms, the Earth's surface would be covered with the bodies of ....
   a. plants. b. living organisms.
   c. animals. d. dead organisms.

2
Lesson

2. Put (✓) or (×) in front of each of the following and correct the wrong one:

1. Ecosystem is any natural area including living organisms like plants and non-living things like water. ( )
2. Introducing new living organisms into a new ecosystem with much food and no enemies causes environmental balance. ( )
3. Plants depend on the soil to get water. ( )
4. Environmental balance is the balance among the components of the ecosystem. ( )
5. Ecosystem may be large as the ocean. ( )
6. A new balance takes place after the occurrence of an environmental imbalance for a long or a short period of time. ( )
7. Interaction among the environmental components leads to the imbalance within the ecosystem. ( )
8. The balance of ecosystem occurs due to the interference of man. ( )
9. Changing the natural conditions leads to the environmental balance. ( )
10. A disturbance in the environmental balance arises as a result of man interference. ( )
11. Predation relationship keeps the balance within ecosystem. ( )
12. Predators recognize the numbers of preys in their populations. ( )
13. When food resources in ecosystem become insufficient, a mutualism appears among preys' populations. ( )
14. Lions are examples of extinct animals due to the change of natural conditions of the environment. ( )
15. Within ecosystem, saprophytic organisms recycle the chemical elements that found in the bodies of dead organisms. ( )
16. Without the activity of saprophytic organisms, the Earth's surface would be covered with bodies of dead organisms. ( )

3. Write the scientific term of each of the following:

1. The natural area which includes living organisms and non-living things. (..................)
2. The balance among the components of ecosystem. (..................)
3. The phenomenon that had occurred to dinosaurs in ancient eras due to change in natural conditions. (..................)

4. A very large ecosystem. (..................)
5. The organisms which organize the numbers of preys' populations in ecosystem. (..................)
6. An example of a living organism that disappears due to the disturbance of the environment. (..................)
7. The phenomenon which appears among preys' populations due to the shortage of food resources in ecosystem. (..................)
8. The relationship which helps preys' population get rid of weak or sick members. (..................)
9. The organisms which clean the Earth's surface from dead bodies. (..................)

4. Complete the following statements:

1. The components of ecosystem are .... and ....
2. Ecosystem may be small as .... or large as .... or very large as ....
3. Ecosystem is a .... area that contains .... and ....
4. The balance between the components of ecosystem is called ....
5. The disturbance happens in ecosystem produced as a result of .... and the ....
6. Some human activities such as .... and .... cause the disturbance of the environmental balance.
7. .... and .... are from the factors that harm the environmental balance.
8. The disturbance produced by a change in the natural circumstances of ecosystem may cause disappearance of some organisms, ... and ....
9. .... is the food relationship that organizes the numbers of preys in their populations.
10. Predators help preys in getting rid of .... or .... members.
11. The disappearance of predators in an ecosystem causes the increase of .... , so the .... become insufficient.
12. .... is from the extinct organisms due to the changing of the natural conditions.
13. .... and .... are from saprophytic organisms.
14. .... help in getting rid of the bodies of .... by decomposing them.

15. Bodies of living organisms contain some chemical elements as .... , ... and phosphorus that return back to the environment with the help of .... organisms.

5. Give reasons for the following:



1. Plants depend on the soil.

....

2. A disturbance may occur in the environmental balance.

....

3. The extinction of dinosaurs in ancient eras.

....

....

4. The change in natural circumstances causes an environmental imbalance.

....

5. A competition may appear among preys' population in ecosystem.

....

6. Predators are useful for the preys' population.

....

....

7. Predation relationship plays an important role in keeping balance within ecosystem.

....

8. Saprophytic organisms give great services to ecosystem.

....

....

....

6. What happens when ... ?

1. • Introducing rabbits into an island with much food and no natural enemies.
   • Predators disappear from an environment including some rabbits.

....

....

2. Cutting down of trees.

....

3. Natural changes take place within ecosystem.

....

....

4. Herbivorous (as rabbits) decrease in the environment.

....



5. There are no predators in ecosystem.

6. Absence of preys in ecosystem.

7. Preys do not find food and shelter within ecosystem.

8. Saprophytes (as bacteria) disappear from the Earth planet.

9. Chemical elements are not recycled by saprophytic organisms in the ecosystem.

7. Explain the relation between each of the following:

1. Plants and the soil.

2. Plants and animals.

3. Different animals.

8. What is meant by ...?

1. Ecosystem.

2. Environmental balance.

9. What is the effect of each of the following on the environmental balance ?

1. Predation.

2. Saprophytism.

10. How does man benefit from saprophytic organisms in the industry ?

Timss Questions



1. **In some countries, burning forests occurs. Complete the following questions:**

a. This phenomenon causes ....

b. This phenomenon related to ....

c. .... and .... are from the factors that cause environmental imbalance.

2. **Look at the following diagram, then answer:**







a. This diagram represents .... balance.

b. What happens if the deer is absent ?

....

c. What happens if there were no predators in this ecosystem ?

....

3. **When a rabbit died, the chemical elements in its body is recycled. Mention the benefit of this process in our environment.**

....

....

UNIT ONE

Energy



Lessons of the unit :

1. Light.
2. Seeing coloured objects.
3. Magnetism.
4. Magnetism and electricity.

Final Revision Includes

- Definitions.
- Give reasons for.
- Comparisons.
- Important points.
- Importance or use.
- What happens when ... ?
- Activities.

1 Unit

FIRST: Final Revision on Unit One

1 Definitions

Item	Definition
1. Visible spectrum :	It is the light energy that can be seen.
2. Shadow :	It is the darkened area which is formed as a result of falling light on an opaque object.
3. Transparent material :	It is the material which lets most light to pass through and objects can be seen clearly (with full details) through it.
4. Semi-transparent (translucent) material :	It is the material which lets some light to pass through and objects can be seen through it less clearly than the transparent one.
5. Opaque material :	It is the material that doesn't allow light to pass through and objects can't be seen through it.
6. Light reflection :	It is the bouncing (returning back) of light rays when light falls on a reflecting surface.
7. Regular reflection :	It is the reflection of light when it falls on a smooth and shiny reflecting surface, where the light rays are reflected directly in one direction.
8. Irregular reflection :	It is the reflection of light when it falls on a rough reflecting surface, where the light rays are reflected and scattered in different directions.
9. Light refraction :	It is the change in the direction of light rays when light passes through a separating surface between two different transparent media, due to the change in the light speed.
10. Light separation :	It is the separation of white light into seven spectrum colours.
11. Primary coloured lights :	They are coloured lights which cannot be broduced by mixing two other coloured lights.
12. Secondary coloured lights :	They are coloured lights that are produced by mixing two of the primary coloured lights.
13. Natural magnet :	It is a black rock and it is one of iron ores called magnetite.
14. Artificial magnet :	It is made by man and has many different shapes and sizes.

15. Magnetic materials :	They are the materials which are attracted to the magnet.
16. Non-magnetic materials :	They are the materials which are not attracted to the magnet.
17. Two poles of magnet (magnetic poles) :	The regions (areas) of magnet which have the most powerful force of attraction. **or** The regions of magnet at which most of the attraction force (magnetism) is concentrated.
18. Magnetic field :	It is the space around the magnet in which the effect of magnetic force appears.
19. Magnetic force :	It is the ability of the magnet to attract the magnetic materials existed in its field.
20. Electromagnet :	It is a temporary magnet which is made by the effect of electricity.

2 Importance or use

Item	Importance or use
1. Glass prism :	It separates white light (sunlight) into seven spectrum colours.
2. Magnet :	– It attracts the magnetic substances as iron, nickel, steel and cobalt. – It is used in our daily life in making the magnetic compass and the electric generator (dynamo).
3. Magnetic compass :	It is used to identify the main four geographical directions.
4. The electromagnet :	– It converts the electric energy into magnetic energy. – It is used in : • Making big-sized winches (cranes) to move (lift) the heavy iron blocks in factories. • Making many appliances (devices) as the electric bell, the electric mixer, the disc drive and television.
5. The electric generator (dynamo) :	– It converts the mechanical (kinetic) energy into electric energy. – It is used in electric power stations to generate a large amount of electricity used for lightening cities and operating factories.

1 Unit

3 Give reasons for

1. **Moon is not considered as a source of light.**
   Because the moon light is the reflection of the sunlight that falls on its surface.
2. **The moon seems luminous.**
   Because it reflects the sunlight that falls on its surface.
3. **The formation of images through narrow holes.**
   Because light travels in straight lines.
4. **Shadow of an opaque body is formed when light falls on it.**
   Because light travels in straight lines.
5. **A clear glass and transparent plastic are transparent materials.**
   Because they allow most light to pass through and objects can be seen clearly (with full details) through them.
6. **A tissue paper is a translucent material.**
   Because it allows some light to pass through and we cannot see objects clearly through it.
7. **Aluminium foil is an opaque material.**
   Because it doesn't allow light to pass through and objects cannot be seen through it.
8. **Objects can be seen clearly through transparent materials.**
   Because transparent materials allow most light to pass through.
9. **Objects cannot be seen clearly through the frosted glass.**
   Because frosted glass is a translucent material which lets some light to pass through.
10. **We can't see anything behind wood.**
    Because wood is an opaque material that doesn't allow light to pass through.
11. **You can see your image in a plane mirror.**
    Due to the regular reflection of light.
12. • **Seeing the pen bending in a transparent cup of water.**
    • **A spoon appears broken when it is placed in a cup of water.**
    Due to the refraction of light.
13. **A light beam changes its direction when it passes from air to water.**
    Due to the refraction of light.

14. **The formation of light spectrum.**
Due to the separation of white light into seven spectrum colours.

15. **White light can be separated.**
Because it consists of seven spectrum colours.

16. **The rainbow appears in the sky during rainfall.**
Because the drops of water in air act as a prism which splits the sunlight into seven spectrum colours.

17. **The green glass window seems green when a white light strikes it.**
Because it is a transparent object, where it absorbs all light colours and allows the green colour only to pass through.

18. **The transparent and semi-transparent bodies appear coloured with the light that pass through them.**
Because the transparent and semi-transparent bodies absorb all light colours and permit their own colours only to pass through.

19. **The red apple seems black when you look at it from a green glass sheet.**
Because the red apple reflects the red colour which is absorbed by the green glass sheet and doesn't transmit through it, so the apple seems black.

20. **A banana fruit seems yellow when sunlight falls on it.**
Because the banana fruit absorbs all light colours and reflects the yellow colour only.

21. **We must wear white clothes in summer season.**
Because white clothes reflect all light colours that fall on them causing the decrease of feeling of heat.

22. **The red transparent ruler appears red when white light falls on it.**
Because it absorbs all light colours and allows the red colour only to pass through.

23. **When sunlight falls on a white paper, it appears white.**
Because white objects reflect all light colours that combine together forming white light.

24. **It is preferred to wear black clothes in winter.**
Because black clothes absorb all light colours that fall on them causing the feeling of warmth.

25. **If a white light strikes a transparent blue glass sheet, the blue light only transmits through it.**
Because the transparent coloured object absorbs all light colours and allows its own colour only to transmit through.

26. Red, green and blue are called primary coloured lights.
Because they can't be produced by mixing two of the other coloured lights.

27. Yellow, magenta and cyan are called secondary coloured lights.
Because they are produced by mixing two of the primary coloured lights.

28. The chalk appears white, while the board appears black.
Because the white opaque objects (chalk) reflect all light colours, while the black opaque objects (board) absorb all light colours.

29. Some materials are called magnetic materials.
Because they are attracted to the magnet.

30. Some materials are called non-magnetic materials.
Because they are not attracted to the magnet.

31. The magnet attracts nickel, but doesn't attract aluminium.
Because nickel is a magnetic material, while aluminium is a non-magnetic material.

32. Aluminium, copper and glass are considered as non-magnetic materials.
Because they are not attracted to the magnet.

33. Iron, nickel and cobalt are considered as magnetic materials.
Because they are attracted to the magnet.

34. One of the poles of the magnet is called north pole, but the other is called south pole.
Because one of the two poles always points to the north pole of the Earth, but the other points to the south pole of the Earth.

35. The north pole of the magnet attracts the south pole of another magnet, but repels the north pole.
Because the like (similar) magnetic poles repel each other, while the dislike (different) magnetic poles attract each other.

36. When you immerse a magnet in iron filings, the iron filings are *attracted* at the two poles of the magnet.
Because the magnetic force of the magnet is concentrated at its two poles.

37. The compass is used to locate the main four geographical directions.
Because its north pole refers to the north direction of the Earth and its south pole refers to the south direction of the Earth.

38. The box of compass isn't made from iron.
To avoid the attraction between the magnetic needle and the iron box of the compass.

39. When an electric current flows through a wire winding around a wrought iron nail, the nail attracts iron filings.
Because the electric current changes the wrought iron nail into a temporary magnet called electromagnet.

40. When an electric current flows through a wire that is put beside a compass, the compass needle deflects.
Because the electric current has a magnetic effect, where it generates a magnetic field.

41. It is preferable to increase the number of coil turns in the electromagnet.
To increase the magnetic force of the electromagnet.

42. In the electromagnet, we must increase the number of batteries.
To increase the electric current intensity that increases the magnetic force of the electromagnet.

43. The lifted steel blocks by the electromagnet fall down by cutting off the electric current that flows through the coil of the electromagnet.
Because by cutting off the electric current, the electromagnet loses its magnetic force.

44. The presence of a battery in the electromagnet is important.
Because the battery is the source of the electric current.

45. We must increase the number of coil turns and the number of *batteries in* the electromagnet.
To increase the magnetic force of the electromagnet.

46. The electromagnet is very important.
Because it is used in factories to lift the heavy iron or steel blocks and used in making many appliances as electric bell, electric mixer, disc drive and television.

47. The magnet which is made by electricity is called temporary magnet.
Because it changes the electric energy into magnetic energy.

48. The small cylinder in the bicycle's dynamo touches the bicycle's wheel tire.
Because by moving the bicycle's tire, the magnet that connected with the cylinder moves, so the electric current is generated in the coil causing lightening of the lamp.

49. The deviation of the ammeter's pointer when moving the copper wire between the two poles of a magnet.
Due to passing the electric current through the copper wire.

50. The deflection of ammeter's pointer increases by increasing the motion of coil between the two poles of a magnet.
Due to the generation of more electric current in the copper wire.

51. The huge *electric* generator is used in the electric power stations.
To generate large amount of electricity used for lightening cities and operating factories.

52. Dynamo changes the mechanical energy into electric energy.
Because by moving the magnet in the coil, an electric current is generated.

53. In dynamo, we use a strong magnet and increase the number of turns in the moving coils.
To increase the produced amount of electricity.

4 What happens when ... ?

1. You look at a lightened candle through three screens with centered holes, where the candle and screens are in one straight line.
I can see the flame of the candle, because light travels in straight lines.

2. You place an opaque object between a light source and a screen.
A clear shadow of the object is formed.

3. You place a transparent object between a source of light and a screen.
No shadow is formed.

4. You look at your image through a transparent material.
I can see the picture clearly.

5. You look at a picture through a frosted glass.
I cannot see the picture clearly.

6. You look at a picture through a metallic sheet as aluminium foil.
I cannot see the picture.

7. You look at a mirror.
I can see my image due to the reflection of light.

8. You look at a spoon (pen) that is put in a beaker containing water.
The spoon (pen) seems broken due to the refraction of light.

9. • **White light passes through a prism.**
• **Sunlight passes from drops of rain water to air during raining.**
The white light is separated (splitted) into seven spectrum colours.

10. **Seven spectrum colours are mixed together.**
A white light is formed.

11. **Green light strikes a black object.**
The black object absorbs the green colour and appears black.

12. **White light strikes a red apple.**
The red apple absorbs all light colours and reflects the red colour only, so it seems red.

13. **White light strikes a transparent yellow bottle.**
The yellow bottle absorbs all light colours and allows the yellow colour only to transmit through.

14. **You look at a green apple through a red glass sheet.**
The apple seems black.

15. **Mixing green and blue lights.**
Cyan light is produced.

16. **White light falls on a white ball.**
The ball reflects all light colours and appears white.

17. **White light falls on a banana fruit.**
The banana fruit absorbs all light colours and reflects the yellow colour only.

18. **Mixing red light with blue light.**
Magenta light is produced.

19. **Mixing red light with green light.**
Yellow light is produced.

20. **A strong magnet is put close to a piece of nickel.**
The piece of nickel is attracted to the magnet.

21. **A strong magnet is put close to a piece of wood.**
The piece of wood is not attracted to the magnet.

22. Some iron nails are put close to the middle of the magnet.

The iron nails are not attracted to the middle of the magnet.

23. A magnet is immersed completely in an amount of iron filings.

The biggest amount of iron filings is attracted to the two poles of the magnet and this amount decreases gradually until it disappears at the middle of the magnet.

24. You get a magnet close to a mixture of iron pins, cobalt, chalk and pieces of paper.

The magnet attracts the iron pins and cobalt only as they are magnetic substances.

25. A magnet is hanged to move freely.

It takes a fixed direction which is north-south direction.

26. You put the north pole of a magnet close to the north pole of another magnet.

The two poles repel each other.

27. You approach the north pole of a magnet to the south pole of another magnet.

The two poles attract each other.

28. You scatter some iron filings on a glass sheet which is put on a strong magnet, then knock on the sheet slightly.

The iron filings are arranged around the magnet in a regular way and attracted at the two poles of the magnet.

29. Fixing a magnetic needle on a piece of cork, then put it in a basin containing water.

The north pole of the needle always points to the north pole of the Earth and its south pole always points to the south pole of the Earth.

30. An electric current flows through a wire winding around a wrought iron bar.

The iron bar becomes a temporary magnet called "the electromagnet".

31. An electric current flows through a wire winding around a wrought *iron nail* that is immersed in iron filings.

The iron nail attracts iron filings as it becomes an electromagnet.

32. **Cutting off the electric current passing through the coil of the electromagnet of the winch.**
The electromagnet loses its magnetic force and iron blocks fall down.

33. **A magnet is moved inside a coil of wire that is connected to an electric lamp.**
The lamp lights due to the generation of an electric current through the wire.

34. **You move a magnet through a coil or moving a coil between the two poles of a magnet.**
The mechanical (kinetic) energy changes into electric energy.

35. **Increasing the motion of coil between the two poles of a magnet in the dynamo.**
It causes increasing of electric current that is generated from dynamo.

5 Comparisons

1. Comparison between transparent, translucent and opaque materials.

Points of comparison	Transparent material	Translucent material	Opaque material
Definition :	It is the material which lets most light to pass through and objects can be seen clearly (in full details) through it.	It is the material which lets some light to pass through and objects can be seen through it less clearly.	It is the material that doesn't allow light to pass through and objects can't be seen through it.
Examples :	- Clear glass. - Clear water. - Air. - Transparent plastic.	- Frosted glass. - Tissue paper.	- Rocks. - Aluminium foil. - Wood. - Carton.

2. Comparison between regular reflection and irregular reflection.

Points of comparison	Regular reflection	Irregular reflection
Definition :	It is the reflection of light on a smooth and shiny reflecting surface, where the light rays are reflected directly in one direction.	It is the reflection of light on a rough reflecting surface, where the light rays are reflected and scattered in different directions.
Example :	Light reflection when it falls on any smooth surface as mirror. Smooth surface	Light reflection when it falls on any rough surface as white paper (which contains protrusions and tiny holes). Rough surface

3. Comparison between primary coloured lights and secondary coloured lights.

Points of comparison	Primary coloured lights	Secondary coloured lights
Definition :	They are coloured lights which impossible to be produced by mixing two other coloured lights.	They are coloured lights that are produced by mixing two of the primary coloured lights.
Examples :	Red, green and blue.	Yellow, magenta and cyan.

4. Comparison between magnetic materials and non-magnetic materials.

Points of comparison	Magnetic materials	Non-magnetic materials
Definition :	They are the materials which are attracted to the magnet.	They are the materials which are not attracted to the magnet.
Examples :	Iron - steel - cobalt - nickel.	Chalk - glass - paper - aluminium - copper - wood.

5. Comparison between electromagnet and dynamo.

Points of comparison	Electromagnet	Dynamo
The structure :	A copper wire coiled (twisted) around a bar of wrought iron and this wire connected to a battery.	A copper coil and a magnet.
The idea of working :	It converts the electric energy into magnetic energy.	It converts the mechanical (kinetic) energy into electric energy.
Uses :	It is used in making : - Big-sized winches (cranes). - Electric bell, electric mixer, disc drive and television.	It is used in electric power stations to generate electricity.

6. Comparison between the small dynamo in a bicycle and the huge dynamo (electric generator).

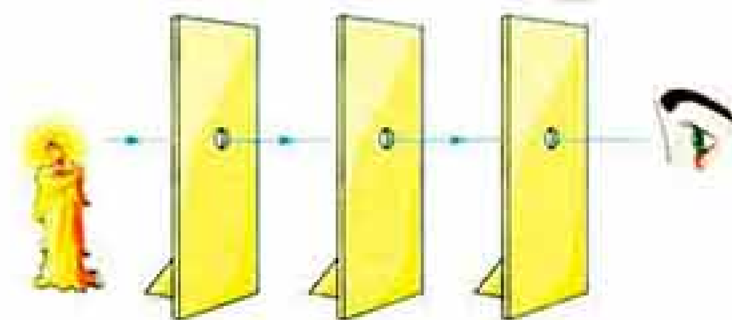
Point of comparison	Small dynamo in a bicycle	Huge dynamo
Structure :	It consists of : - A small cylinder that touches the bicycle's wheel tire. - This small cylinder is connected with a U-shaped (horse-shoe) magnet that is surrounded by a coil.	It consists of : Many great coils that turn between the two poles of a huge magnet.

6 Activities

Activity 1 To prove that light travels in straight lines.

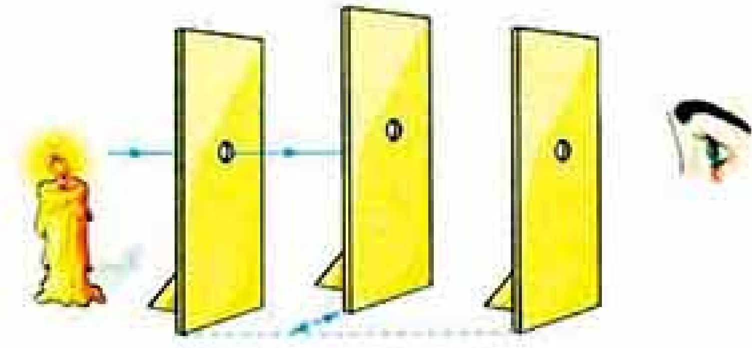
Steps:

1. Put the three wooden screens in a row, where all the holes of the screens and the flame of the candle are on one straight line.



Observation:
You can see the flame of the candle.

2. Move any of the screens to the right side or the left side.

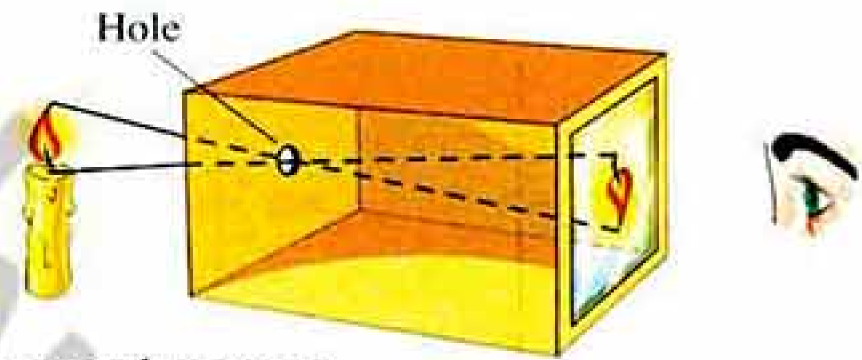


Observation:
You cannot see the flame of the candle.

Inference :
Light travels in straight lines.

Activity 2 To prove that formation of images through narrow holes is due to travelling of light in straight lines.

Step:
Form the opposite structure.

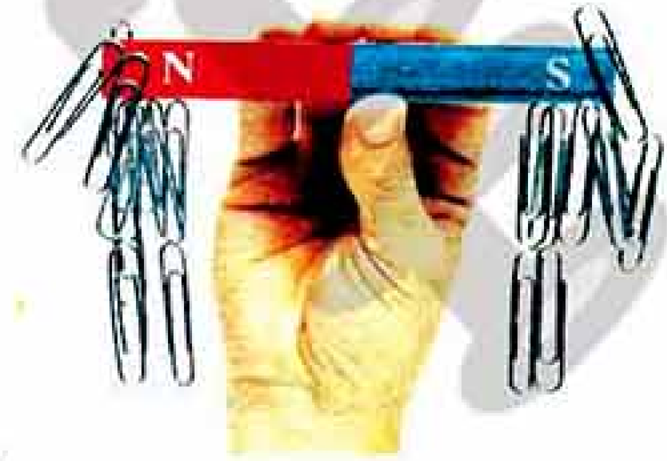


Observation:
A minimized and inverted image for the candle flame is formed on the semi-transparent paper.

Inference :
Formation of images through narrow holes is due to the travelling of light in straight lines.

Activity 3
- To show that the magnet has two poles.
- To discover the regions (areas) of the magnet which have the ability to attract more.

Step:
Approach a bar magnet to metallic paper clips.



Observation:
The greatest number of the metallic paper clips is attracted to the two ends of the magnet, then it decreases gradually until it disappears in the middle.

Inference :
The regions of the magnet which have the most attraction force are the two ends which are called "two poles of magnet".



Activity 4 To prove that like (similar) magnetic poles repel, but dislike (opposite) magnetic poles attract.

Steps	Figures	Observations
1. Bring two bar magnets and hang one freely by a thread, then leave it to settle.	N N S	- The freely hanged magnet takes the north-south direction.
2. Approach the north pole of the other magnet to the north pole of the hanging magnet as in fig. (a).	Fig. (a)	- The two north poles repel each other.
3. Approach the south pole of the magnet to the south pole of the hanging magnet as in fig. (b).	S S N Fig. (b)	- The two south poles repel each other.
4. Approach the north pole of the magnet to the south pole of the hanging magnet as in fig. (c).	N N S Fig. (c)	- The north pole attracts the south pole.



Inference :

The similar (like) magnetic poles repel each other, but the opposite (dislike) magnetic poles attract each other.



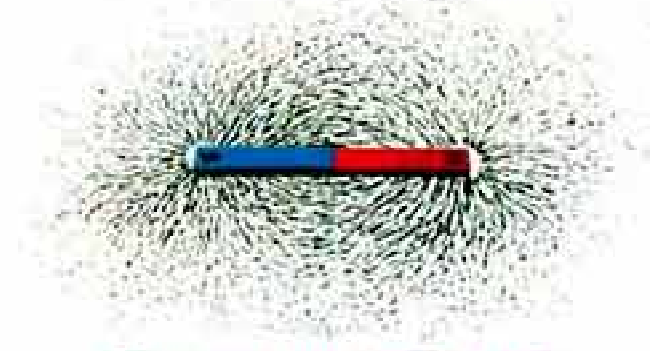
Activity 5 To illustrate the magnetic field of a magnet by using iron filings.

Steps:

1. Put a bar magnet horizontally on a table, then put a glass sheet on it.
2. Sprinkle some iron filings on the glass sheet, then knock on it slightly.

Observations:

- Iron filings are arranged around the magnet in a regular way.
- The biggest amount of iron filings are assembled at the two poles of the magnet.



The magnetic field of a magnet by using iron filings

Inferences :

1. The magnetic field around the magnet takes a regular shape.
2. The greatest magnetic force of the magnet is concentrated at the two poles.



Activity 6

- To show the magnetic effect of the electric current.
- To prove that the electric current can generate a magnetic field.

Steps	Figures	Observations
1. Put the insulated wire beside the compass which is put in four different positions as in fig. (a).	Battery, (a), (b), (c), (d), Compass, Insulated wire Fig. (a)	1. The compass needle doesn't deflect.
2. Connect the wire ends with the two poles of the battery, then notice the compass needle in the four different positions as in fig. (b).	Battery, (a), (b), (c), (d), Compass, Insulated wire Fig. (b)	2. The compass needle deflects after the flowing of electric current through the wire.

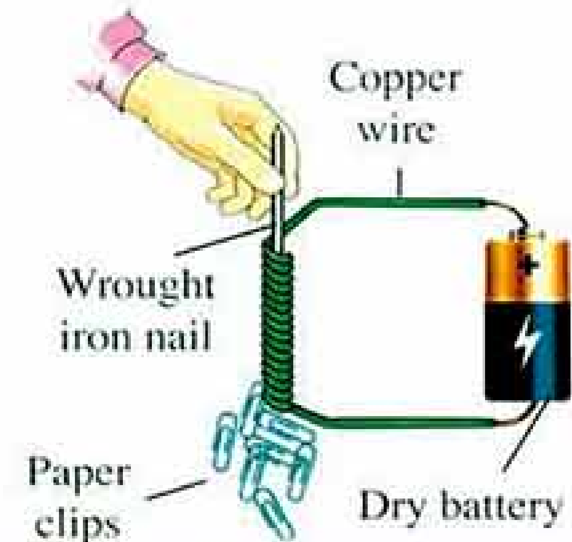
Inference :

The electric current has a magnetic effect, where it generates a magnetic field.



Activity 7

- To prove that magnetism can be gained by electricity.
- To show the idea of working the electromagnet.



Step:

Form the opposite structure.

Observation:

The iron nail attracts the paper clips.

Inference :

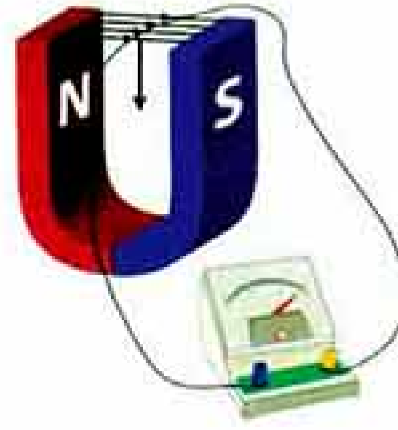
When an electric current passes through a coil winding around a wrought (soft) iron nail, the iron nail becomes a temporary magnet that is called "the electromagnet".



Activity 8

- To show the idea of operating the dynamo.
- To prove that the magnetic energy can be changed into electric energy.

Steps	Figures	Observations
1. Put the copper wire (which is connected with ammeter) between the two poles of the magnet.	Magnet, Copper wire, N, S, Ammeter	The pointer of the ammeter doesn't deflect.
2. Move the copper wire from up to down between the two poles of the magnet.	N, S	The pointer of the ammeter deflects due to passing the electric current through the wire.

3. Increase the motion of the wire between the two poles of the magnet.		The deflection of the ammeter's pointer increases due to passing more electric current.
4. Fix the wire and move the magnet up and down.		The pointer of the ammeter deflects.

Inferences :

1. The electric current can be generated in a coil of dynamo by :
   a. Moving the coil in the magnetic field (between the two poles of the magnet).
   b. Moving a magnet inside the coil.
2. The generation of the electric current in the coil of dynamo increases by increasing the motion of coil between the two poles of magnet.
3. The idea of operating dynamo is the changing of mechanical (kinetic) energy into electric energy.

7 Important points

1. The **Sun** is the main source of light on the Earth.
2. **Lightened electric lamps**, **lightened candles** and **kerosene lamps** are from the sources of light.
3. As a result of travelling light in straight lines, some phenomena happen as :
   - **Formation of images through narrow holes**.
   - **Formation of shadow**.
4. The idea of camera depends on the **formation of images through narrow holes**.
5. The **nearer** object to the light source has the **bigger** shadow.
6. Factors necessary for light reflection are :
   - **A source of light**.
   - **A reflecting surface**.

7. When you look at a mirror, you notice that the distance between your body and the mirror **is equal to** the distance between your image and the mirror.

8. The colour of the **transparent and translucent objects** is the same colour of **the transmitted light** through them.

9. Opaque objects are divided into :
   - **White objects**.
   - **Black objects**.
   - **Coloured objects**.

10. Coloured opaque object **absorbs all light colours** and reflects its **own colour** only.

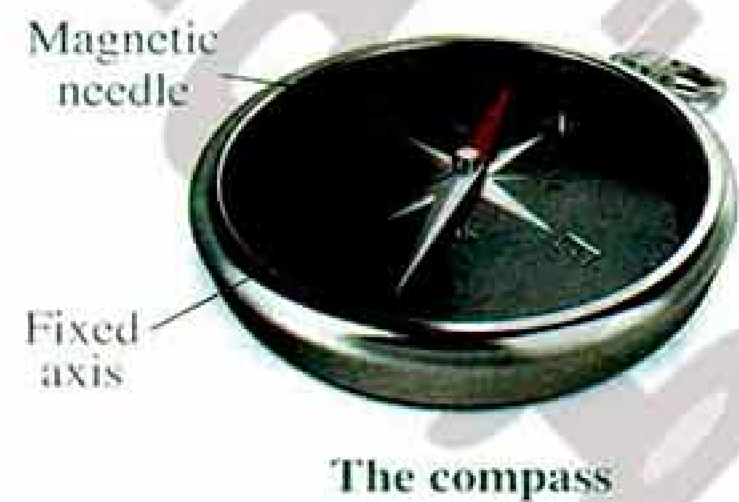
11. Types of magnet are **natural** magnet and **artificial** (man-made) magnet.

12. Horse-shoe magnet, ring magnet, bar magnet and magnetic needle are **the shapes of artificial magnet**.

13. **The properties of the magnet are** :
   - The magnet has **two poles**.
   - The freely moving (suspended) magnet always takes a fixed direction, which is **north-south direction**.
   - Like magnetic poles **repel** each other, but the dislike magnetic poles **attract** each other.
   - The magnet is surrounded by an area called **"magnetic field"**.

14. The magnetized needle is the basic idea in making **the compass**.

15. **The magnetic compass consists of :**
   A light and small magnet that can spin freely around a fixed axis.



The compass

16. **The magnetic force of the electromagnet can be increased by** :
   - Increasing the number of coil turns.
   - Increasing the number of batteries.

17. **The methods to increase the produced amount of electricity from the dynamo :**
   - By using a strong magnet.
   - By increasing the number of turns in the moving coils.

Mixtures

UNIT TWO

Lessons of the unit :

1. Mixtures.
2. Solutions.

Final Revision Includes

- Definitions.
- Give reasons for.
- Important table.
- Activities.
- Uses.
- What happens when ... ?
- Comparisons.
- Important points.

Second : Final Revision on Unit Two

1 Definitions

Item	Definition
1. Pure substance :	It is the substance that is made of only one type of identical particles.
2. Mixture :	It is the substance that consists of more than one type of particles.
3. Solid-solid mixture :	A type of mixtures that consists of two or more different solid materials.
4. Liquid-liquid mixture :	A type of mixtures that consists of two or more different liquids.
5. Solid-liquid mixture:	A type of mixtures that consists of solid and liquid matter.
6. Gaseous-gaseous mixture :	A type of mixtures that consists of different gases.
7. Gaseous-liquid mixture :	A type of mixtures that consists of gaseous and liquid matter.
8. Homogeneous mixtures :	They are mixtures in which their components can't be distinguished.
9. Heterogeneous mixtures :	They are mixtures in which their components can be distinguished.
10. Solute :	It is the substance which dissolves in a solvent.
11. Solvent :	It is the substance in which solute disperses or dissolves.
12. Solution :	It is a homogeneous mixture in which the solute breaks down into its most basic particles that spread throughout the solvent.
13. Solubility process :	It is the process by which a solute dissolves in a solvent leading to the disappearance of the solute.
14. Suspension :	It is a heterogeneous mixture in which some particles of solute are suspended throughout the solvent.

2
Unit

2 Uses

Item	Use
1. Shaking process :	A method used to form solid-solid, liquid-liquid and solid-liquid mixtures.
2. Stirring process :	A method used to form liquid-liquid and solid-liquid mixtures.
3. Grinding process :	A method used to form solid-solid mixtures.
4. Magnetic attraction (magnet) :	It is a method used to separate solid mixtures that contain magnetic substances.
5. Filtration process (filter paper) :	It is used to separate solid materials that are insoluble in water.
6. Evaporation process :	It is a method used to separate solid materials which are soluble in water.
7. Separating funnel :	It is a device used to separate the heterogeneous liquid mixtures whose components don't mix together (as water-oil mixture).

3 Give reasons for

1. **Both distilled water and baking soda are pure substances.**
   Because each of them consists of only one type of identical particles.
2. **Both milk and tomato sauce are mixtures.**
   Because each of them consists of more than one type of particles.
3. **Air is considered a mixture.**
   Because it consists of more than one type of particles such as nitrogen gas, oxygen gas, carbon dioxide gas and water vapour.
4. **Mineral water is considered a mixture.**
   Because it consists of more than one type of particles such as water and some useful minerals such as calcium and magnesium.
5. **Strawberry juice and lemon juice can be mixed by shaking or stirring.**
   Because liquid materials can be mixed to form liquid-liquid mixtures by shaking or stirring.

6. **Filtration process is used to separate sand from sugary solution.**
   Because filtration process is used to separate the solid materials as sand that are insoluble in water.
7. **A magnet can be used to separate iron filings from sand.**
   Because magnet attracts the iron filings and separates them from the mixture.
8. **A mixture of salt and water is different from a mixture of sand and water.**
   Because salt dissolves in water forming salty solution (homogeneous mixture), while sand doesn't dissolve in water (heterogeneous mixture).
9. **No mixing will happen on adding sand to water.**
   Because sand is an insoluble material in water.
10. **The method used to separate a mixture of iron filings and sand is different from that used to separate a mixture of sand and water.**
    Because the mixture of iron filings and sand can be separated by magnetic attraction, but the mixture of sand and water can be separated by filtration process.
11. **Some mixtures can be separated by using the separating funnel.**
    Because the separating funnel is used to separate liquid mixtures whose components don't mix together, the heterogeneous liquid mixtures (as water-oil mixture).
12. **Solution is a type of mixtures.**
    Because it consists of more than one type of particles.
13. **There are different types of mixtures.**
    Because some solid substances are soluble forming homogeneous mixtures (solutions), while others are insoluble forming heterogeneous mixtures (suspensions).
14. **Water is considered a common solvent.**
    Because thousands of solid materials dissolve in it.
15. **Tea and sugary solution are homogeneous liquid mixtures (solutions).**
    Because the components of each of them can't be distinguished from each other.
16. **Mud in water is a heterogeneous mixture.**
    Because the particles of mud can be distinguished from water.
17. **In chocolate-milk, chocolate is considered the solute.**
    Because it is the solid substance that dissolves in milk which is the solvent.



18. The solubility speed depends on the temperature of the solution.
Because when the temperature of the solution increases, the solubility speed increases.

19. The solubility time of sodium chloride in water differs from that of sodium carbonate in the same amount of water.
Because the solubility time depends on the kind of the solute.

20. Dissolving 20 gm. of table salt in 200 ml. of water is faster than dissolving 50 gm. of table salt in the same amount of water.
Because when the amount of the solute increases, the solubility time increases.

21. • Dissolving sugar in hot tea is easier than that in cold lemonade.
• Dissolving salt in heated water is faster than that in cold water.
Because when the temperature increases, the solubility speed increases.

22. • It is better to dissolve sugar in water by heating and stirring.
• The dissolving time of any solid substance in a liquid decreases by stirring and heating.
Because by heating and stirring, the solubility process becomes faster (solubility time decreases).

23. We prefer putting powdered sugar than cubes of sugar in tea.
Because grinding the solid materials increases the speed of their solubility.

24. Salt dissolves easily and faster in a large amount of water.
Because when the amount of solvent increases, the solubility time decreases.

4 What happens when ... ?

1. Shaking or stirring an amount of sugar with water.
A homogeneous mixture (sugar solution) is formed.

2. Putting an amount of sand in a cup of water with shaking, then waiting for a minute.
At first, they seem to be mixed, but with time the sand precipitates in the bottom of the cup.

3. Mixing an amount of oil with an amount of water.
Oil doesn't mix with water and form a layer over it.

4. Heating salty water for a long time.
Water evaporates, leaving the salt in the cup.

5. Grinding salt with pepper.
A mixture of salt-pepper is formed.

6. Mixing different types of juices together.
A liquid-liquid mixture of juices is formed.

7. Dissolving carbon dioxide gas in a sugary solution.
A mixture of soda water is formed.

8. Approaching a magnet to a mixture of sand and steel paper clips.
The magnet attracts the steel paper clips, leaving the sand.

9. Leaving an amount of table salt solution exposed to sunlight for some days.
Water evaporates and table salt can be collected.

10. Adding an insoluble substance to a certain solvent.
A heterogeneous mixture (suspension) is formed.

11. The amount of the solvent increases.
The solubility time decreases.

12. The amount of the solute increases.
The solubility time increases.

13. The temperature of the solution decreases.
The solubility time increases.

14. Stirring a mixture of salt and water.
The solubility time decreases.

15. Stirring two equal amounts of sugar in two beakers contain unequal amounts of water.
The solubility time of sugar in the beaker that has a large amount of water is less than that has a small amount of water.

2 Unit

5 Important table

Substance	Method of separation
1. Salt from salty water.	By evaporation process.
2. Iron filings from iron-sand mixture.	By using a magnet.
3. Oil from oil-water mixture.	By using a separating funnel.
4. Sand from water-sand mixture.	By using a filter paper (filtration process).
5. Steel paper clips from a mixture of steel paper clips and flour.	By using a magnet.
6. Chalk powder from water.	By using a filter paper (filtration process).
7. Coffee from water.	By using a filter paper (filtration process).

6 Comparisons

1. Comparison between the solute and the solvent.

Points of comparison	The solute	The solvent
Definition :	It is the substance that dissolves in a liquid substance (solvent).	It is the liquid substance in which the solute dissolves.
Example :	Salt in salty solution.	Water in salty solution.

2. Comparison between mixture and solution.

Points of comparison	Mixture	Solution
Definition :	It is the substance that consists of more than one type of particles.	It is a type of mixtures that consists of a solute and a solvent.
Examples :	Fruit salad - vegetable salad - soda water - air.	Sugary solution - salty solution - chocolate milk.

3. Comparison between pure substance and mixture.

Points of comparison	Pure substance	Mixture
Definition :	It is the substance that is made of only one type of identical particles.	It is the substance that consists of more than one type of particles.
Examples :	Distilled water - sugar - baking soda.	Concrete - tomato sauce - mineral water.

4. Comparison between homogeneous and heterogeneous mixture.

Points of comparison	Homogeneous mixture	Heterogeneous mixture
Definition :	It is the mixture in which its components can't be distinguished from each other.	It is the mixture in which its components can be distinguished from each other.
Example :	Salty solution.	Mud in water.

5. Comparison between solution and suspension.

Points of comparison	Solution	Suspension
Definition :	It is a homogeneous mixture in which the solute breaks down into its most basic particles that spread throughout the solvent.	It is a heterogeneous mixture in which some particles of the solute are suspended throughout the solvent.
Example :	Salty solution.	Mud in water.

6. Comparison between a soluble and an insoluble substance.

Points of comparison	A soluble substance	An insoluble substance
Definition :	- It is the substance that dissolves in a solvent. - The formed homogeneous mixture is called solution.	- It is the substance that does not dissolve in a solvent. - The formed heterogeneous mixtue is called suspension.
Example :	Salt in salty solution.	Mud in water.

2 Unit

7 Activities



Activity 1 To separate a solid mixture by using magnetic attraction.

Steps:

1. Mix an amount of sand with an amount of iron filings using gloves.
2. Approach a magnet to the mixture.



Observation:

The magnet attracts iron filings only.

Inference:

A magnet is used to separate the solid mixtures that contain magnetic substances as iron by magnetic attraction.



Activity 2 To separate a heterogeneous liquid mixture (water-oil mixture) by using a separating funnel.

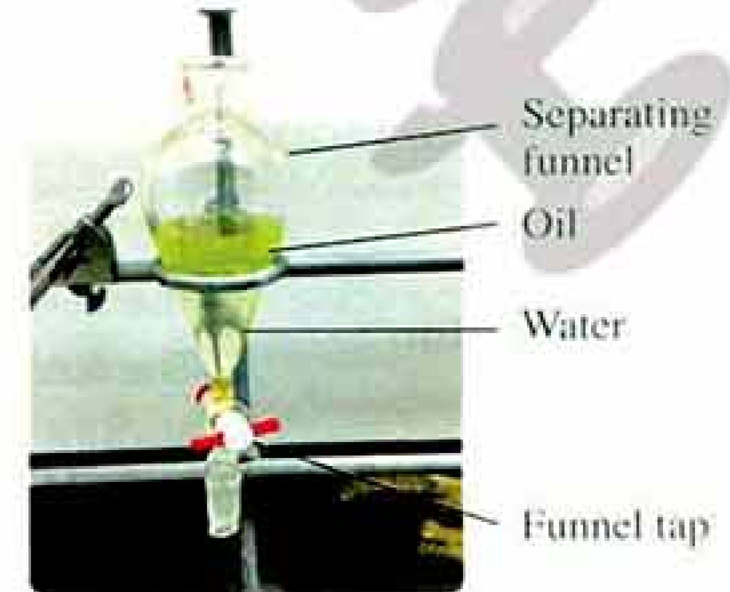
Steps:

1. Add an amount of oil to a cup containing water and shake them well.
2. Pour the mixture into a separating funnel and use its tap to separate water from oil.



Observations:

1. Oil doesn't mix with water, but it forms a layer on the water surface.
2. Water falls down from the separating funnel, but oil remains in the separating funnel.



Inference:

Separating funnel is used to separate heterogeneous liquid mixtures such as water-oil mixture.



Activity 3 To prove that the quantity of solvent affects the solubility process.

Steps:

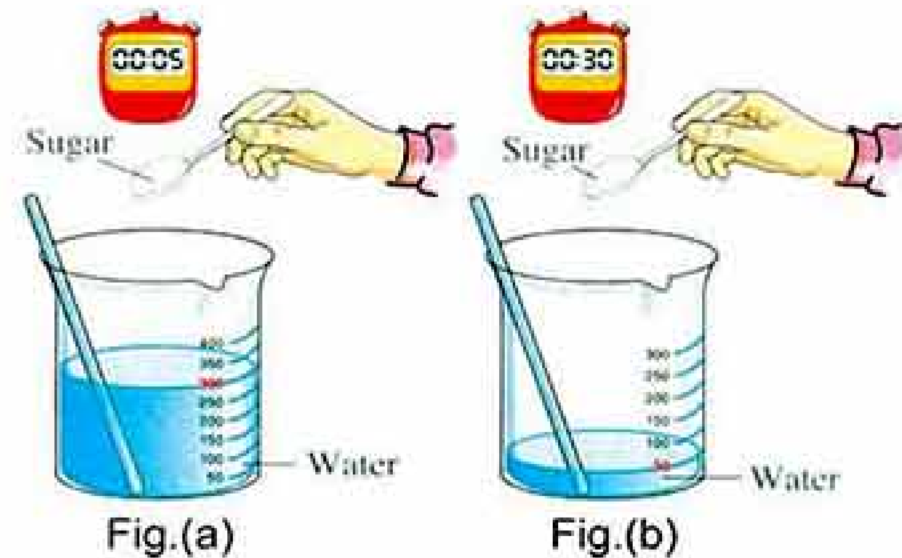


Fig.(a) Fig.(b)

1. Stir an amount of sugar (solute) in 300 ml. of water (solvent) as in fig.(a) and stir the same amount of sugar in 50 ml. of water as in fig.(b).
2. Record the time needed for sugar to dissolve completely in each case.

Observation:

Dissolving sugar in fig.(a) is faster than that in fig.(b).

Inference:

Solubility process depends on the amount of solvent, where by increasing the quantity of solvent, the speed of solubility increases and vice versa.



Activity 4 To prove that quantity of solute affects the solubility process.

Step:

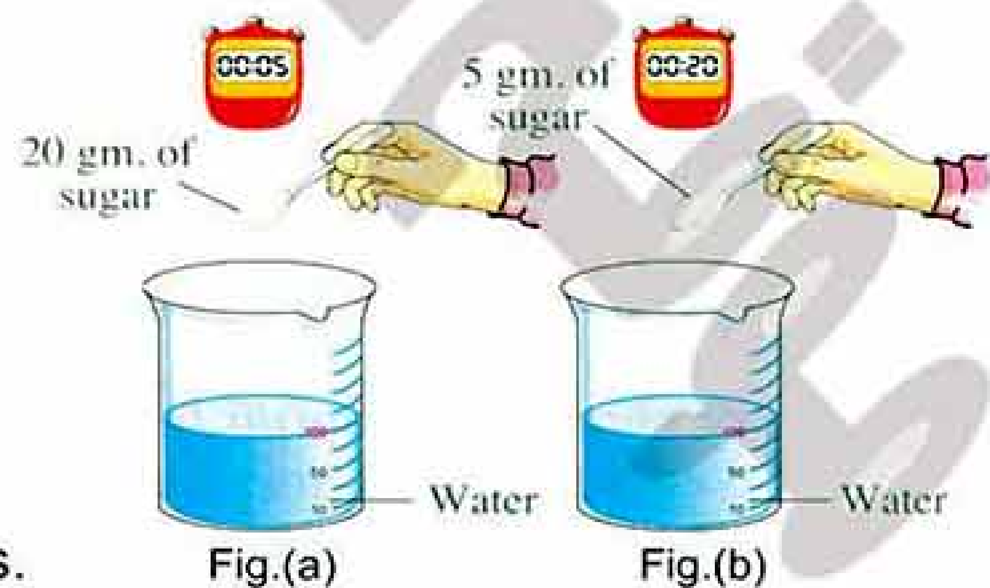


Fig.(a) Fig.(b)

Form the two opposite beakers and record the time needed for sugar to dissolve in each case.

Observation:

The solubility time increases when the quantity of sugar (solute) increases.

Inference:

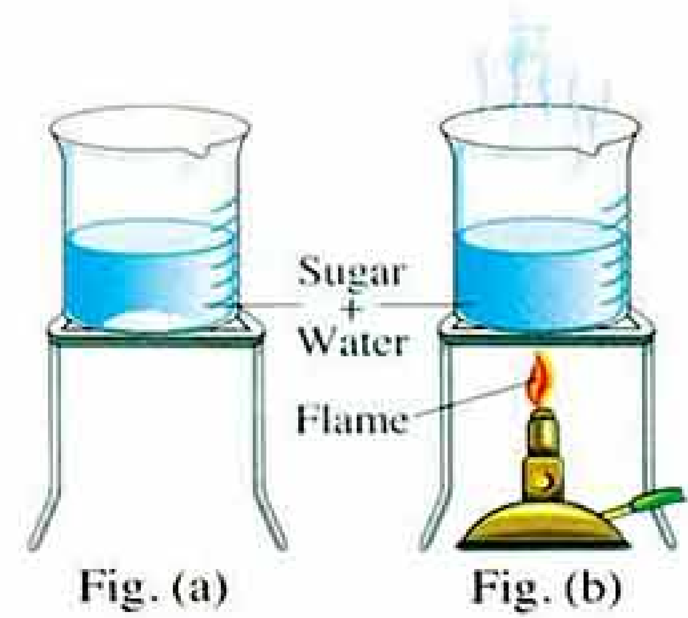
Solubility process depends on the amount of solute, where by decreasing the quantity of solute, the speed of solubility increases and vice versa.

2
Unit

Activity 5 To prove that temperature affects the solubility process.

Steps:

1. Put two equal amounts of sugar in two beakers containing the same amount of water as in figures (a & b).
2. Heat beaker (b) and leave beaker (a) without heating, then record the time needed to dissolve sugar in each case.



Observation:

Sugar in beaker (b) takes a shorter time to dissolve than in beaker (a).

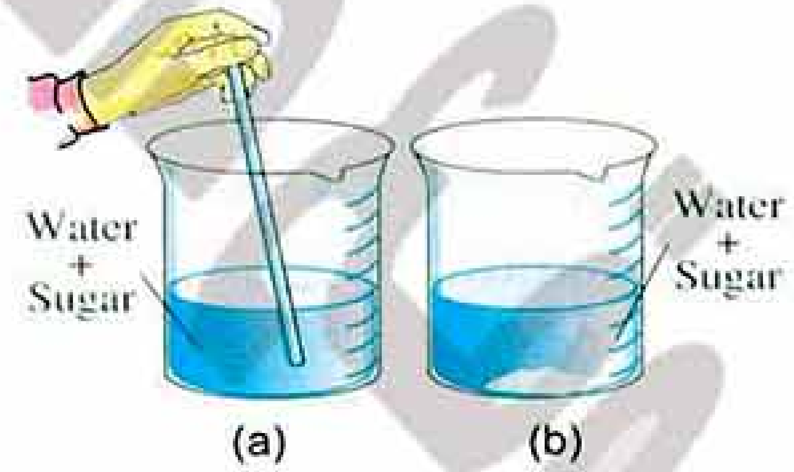
Inference:

By increasing temperature and using the same amount of solvent and solute, the dissolving (solubility) time decreases.

Activity 6 To prove that stirring affects the solubility process.

Step:

Prepare the two opposite beakers, but stir beaker (a) only and record the time needed to dissolve sugar in each beaker.



Observation:

In case of stirring, the sugar takes a short time to dissolve.

Inference:

Stirring increases the speed of the solubility process.



Activity 7 To prove that the kind of the solute affects the solubility process.

Step:

Form the two opposite beakers, then record the time needed to dissolve each substance.

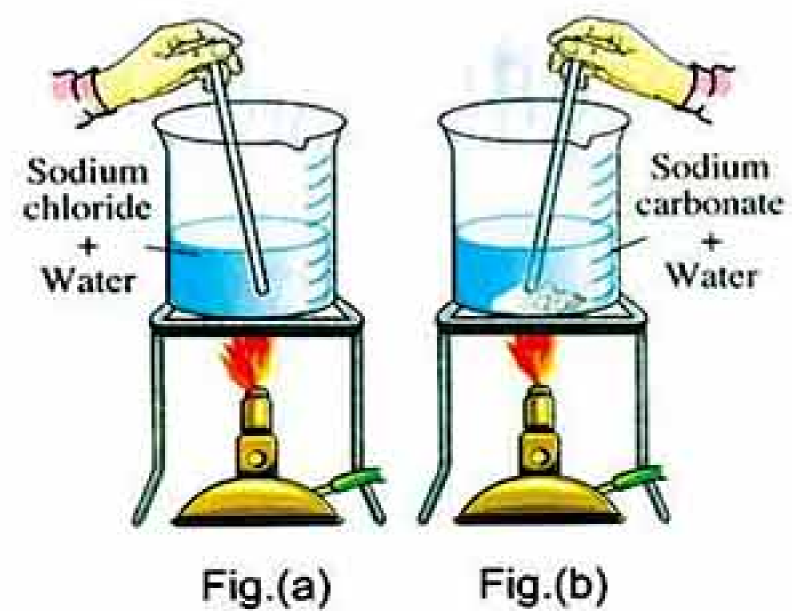


Fig.(a) Fig.(b)

Observation:

The time needed to dissolve sodium chloride differs from that needed to dissolve sodium carbonate.

Inference:

The solubility process depends on the kind of the solute.

8 Important points

1. The properties of mixture :

- The components of the mixture don't react together and can be separated easily.
- Each component in the mixture keeps its own properties, so the properties of a mixture are the same properties of its components.
- The components of the mixture can be mixed at any ratio.

2. Methods of formation of mixtures are :

- Shaking.
- Stirring.
- Grinding.

3. Methods of separating mixtures are :

- Magnetic attraction.
- Filtration process.
- Evaporation process.
- Using a separating funnel.

4. **Most mixtures** that are formed by dissolving in liquids are **homogeneous mixtures.**

5. On adding **an insoluble substance** to a certain solvent, **a suspension** is formed.

6. Factors affecting the solubility process are :

a. Quantity of solvent and solute.
b. Temperature.
c. Stirring or shaking.
d. The kind of the solute.
e. Grinding the solid materials.

Environmental Balance

UNIT THREE

Lessons of the unit :

1. Food relationships among living organisms.
2. Environmental balance.

Final Revision Includes

- Definitions.
- Give reasons for.
- Important tables.
- Important points.
- Importance.
- What happens when ... ?
- Comparisons.

Third : Final Revision on Unit Three

1 Definitions

Item	Definition
1. Predation :	It is a food relationship among living organisms, where one living organism devours another one.
2. Predator :	The living organism which devours other living organism.
3. Prey :	The devoured living organism.
4. Camouflage :	A phenomenon in which living organism protects itself (hides) from enemies by changing its colour to simulate the colours of its surrounding environment.
5. Mimicry :	A phenomenon in which the harmless living organisms imitate other harmful or poisonous living organisms to frighten their enemies and escape from them.
6. Mutualism :	It is a food relationship in which each organism gets benefit (in the form of food) from the other.
7. Commensalism :	It is a food relationship between two living organisms, where one of them benefits from the other, while the other neither gets benefit (in the form of food) nor is harmed.
8. Parasitism :	It is a food relationship between two different kinds of living organisms, one benefits from the other and is known as the parasite, while the other is harmed and is known as the host.
9. External parasitism :	A food relationship in which the parasite lives externally on the host's body and feeds by sucking the blood of the host and conveys diseases to the host.
10. Internal parasitism :	A food relationship in which the parasite lives internally inside the host's body and shares the host its digested food or feeds on its tissues and cells.
11. Saprophytism :	It is a food relationship in which saprophytes (decomposers) get their food by decomposing food remains or bodies of dead organisms.

12. Ecosystem :	It is any natural area including living organisms (as plants and animals) and non-living things (as water, soil and air).
13. Environmental balance :	It is the balance among the components of ecosystem.

2 Importance

Item	Importance
1. Predation relationship :	It plays an important role in keeping the environmental balance, where it organizes the numbers of preys' populations.
2. Saprophytic organisms (decomposers) :	1. They help the environment in : a. Getting rid of bodies of dead organisms by decomposing them. b. Recycling the chemical elements found in the bodies of dead organisms (as carbon, nitrogen and phosphorus) to the environment ,to make other living organisms benefit from them. 2. They help man in some industries as : a. Food industry, where some saprophytic organisms are used in making cheese, yoghurt, vinegar, bread and alcohol. b. Drug industry as in manufacturing some drugs as antibiotics. c. Leather tanning industry.

3 Give reasons for

1. **Plants are called autotrophic organisms.**
   Because they make their own food during photosynthesis process.
2. **Plants are the main food for lions, although lions are carnivorous.**
   Because lions feed on animals (as deers) which feed on green plants.
3. **Predation is a temporary relationship.**
   Because it ends up by devouring the prey or a part of it.
4. **Predation is less common in plant world than in animal world.**
   Because plants are autotrophic organisms that can make their own food by photosynthesis process.
5. **Some plants cannot make protein although they make their own food.**
   Because these plants cannot absorb some compounds from the soil to make protein.

6. • **Drosera and dionaea are known as insectivorous plants.**
 • **Some plants are known as insectivorous plants.**
 Because these plants prey some insects to get their required elements for making protein.

7. **The relation between a wolf and a rabbit is predation.**
 Because wolf feeds on rabbit.

8. **Some animals have the ability to camouflage.**
 To protect themselves from enemies by changing their colour to simulate the colours of their surrounding environment.

9. **A cuttlefish can hide from its enemies.**
 Because it ejects a black fluid in the surrounding water when attacked by enemies to hide from them.

10. • **A butterfly stands on a tree with the similar colour.**
 • **Sepia ejects a black fluid in the surrounding water when attacked by enemies.**
 • **The chameleon simulates the colour of the surrounding environment.**
 To hide from its enemies.

11. • **Some bees look like wasps in forming lines on their bodies.**
 • **Some harmless living organisms imitate other kinds of poisonous living organisms.**
 To fear their enemies and escape from them by mimicry phenomenon.

12. **There is a mutualism relationship between nodular bacteria and leguminous plants.**
 Because nodular bacteria provides the leguminous plants with nitrogen in an inorganic form, while the leguminous plants provide the bacteria with sugar.

13. **There is a commensalism relationship between sponge and the tiny aquatic living organisms.**
 Because the tiny aquatic living organisms get food and shelter from the canals and fissures that are found inside the sponge, while the sponge neither gets benefit nor is harmed from these living organisms.

14. Parasitism relationship differs from the predation relationship.

Because the parasite depends completely on the host to get its food and causes weakness to the host, but doesn't kill it as the predator does with its prey.

15. Host death is considered a loss to the parasite.

Because the parasite will lose its source of food and shelter.

16. • Parasitism causes weakness to the host.
• The parasite doesn't kill its host.

Because the parasite depends completely on the host to get its food causing weakness to the host.

17. Lice, bugs, mosquitoes and ticks are external parasites.

Because they live externally on the host's body and feed by sucking its blood.

18. Tape worms, bilharzia and liver worms are internal parasites.

Because they live internally inside the host's body and share the host its digested food or feed on its tissues and cells.

19. Saprophytic organisms are decomposers.

Because they get their food by decomposing food remains or bodies of dead organisms.

20. Bread mold, mushroom and penecillium fungi are saprophytes.

Because they get their food by decomposing food remains or bodies of dead organisms.

21. Plants depend on the soil.

To absorb water and salts to make its own food by photosynthesis process.

22. A disturbance may occure in the environmental balance.

Due to natural changes or man interference.

23. The extinction of dinosaurs in ancient eras.

Due to the change in the natural conditions in the ecosystem that causes the disappearance of dinosaurs.

24. The changing of natural circumstances causes an environmental imbalance.

Because it causes disappearance of some organisms and appearance of other organisms.

25. A competition may appear among preys' populations in the ecosystem.
Due to the insufficient food resources for preys.

26. Predators are useful for the preys' populations.
Because they help preys to get rid of weak or sick members and let the strong ones to reproduce adding strong members to the population.

27. Predation relationship plays an important role in keeping balance within the ecosystem.
Because predation organizes the numbers of preys' populations.

28. Saprophytic organisms give great services to the ecosystem.
Because they help the environment in getting rid of bodies of the dead organisms and recycling the chemical elements found in the bodies of dead organisms to the environment to make other organisms benefit from them.

4 What happens when ... ?

1. Food producers (as green plants) are not found.
Death of all living organisms.

2. A chameleon is attacked by enemies.
It simulates the colours of its surrounding environment.

3. A cuttlefish is attacked by enemies.
It ejects a black fluid in the surrounding water.

4. There is no nodular bacteria in roots of leguminous plants as beans.
The leguminous plants cannot get nitrogen in an inorganic form.

5. A parasite lives externally on the host's body.
It sucks the blood of the host and may convey diseases to the host.

6. You splash some water drops on a slice of bread and leave it for two weeks.
A dark green layer is formed on the bread, so the bread changes into rotten bread.

7. • Introducing rabbits into an island with much food and no natural enemies.
• Predators disappear from an environment including few rabbits.
The number of rabbits will increase, so the food resources become insufficient for rabbits that leads to competition between them, so rabbits will die.

8. Cutting down of trees.
A disturbance in the environmental balance will take place.

9. Natural changes take place within ecosystem.
A disturbance in the ecosystem will take place causing a disappearance of some organisms, appearance of other organisms and environmental imbalance.

10. Herbivorous (as rabbits) decrease in the environment.
A competition appears among the predators that feed on herbivorous, so the number of predators will decrease.

11. There are no predators in ecosystem.
The number of preys increases and the food resources become insufficient for preys leading to the competition between preys, so they will die.

12. Absence of preys in the ecosystem.
The environmental imbalance will occur.

13. Preys do not find food and shelter within ecosystem.
A competition takes place between preys to get food and shelter and this causes their death.

14. Saprophytes as bacteria disappear from the planet Earth.
- The Earth's surface will be covered with the bodies of dead organisms.
- Chemical elements found in the bodies of dead organisms will not be recycled to the environment.

15. Chemical elements are not recycled by saprophytic organisms in the ecosystem.
The other living organisms cannot get benefit from these elements.

5 Important tables

1. Some food relationships :

The relation between	Its kind
1. A lion and a deer.	Predation.
2. Drosera and an insect.	Predation.
3. A wolf and a rabbit.	Predation.
4. A cat and a rat.	Predation.
5. Nodular bacteria and leguminous plants.	Mutualism.

The relation between	Its kind
6. Sponge and the tiny aquatic living organisms.	Commensalism.
7. Bread mold fungus and bread.	Saprophytism.
8. Penecillium fungus and orange.	Saprophytism.
9. Mosquito and its host.	External parasitism.
10. Lice and its host.	External parasitism.
11. Liver worm and its host.	Internal parasitism.
12. Fleas and their host.	External parasitism.
13. Jawless lamprey and a fish.	External parasitism.
14. Bugs and their host.	External parasitism.
15. Tape worms and their host.	Internal parasitism.
16. Ascaris worms and their host.	Internal parasitism.
17. Ticks and their host.	External parasitism.

2. Phenomena used by some organisms to hide from their enemies :

The organism	The phenomenon that is used to hide from enemies
1. A butterfly.	**Camouflage.** (It stands on a tree with its similar colours)
2. Some types of frogs.	**Camouflage.** (They simulate the colours of the surrounding environment)
3. A chameleon.	**Camouflage.** (It simulates the colours of the surrounding environment)
4. A cuttlefish.	**Camouflage.** (It ejects a black fluid in the surrounding water)
5. Some bees.	**Mimicry.** (They look like wasps)

3. Parasites and diseases :

Parasite	Its type	Disease caused by it
1. Filaria worm.	Internal parasite.	Elephantiasis.
2. Mosquitoes.	External parasites.	Malaria disease.
3. Ascaris worms.	Internal parasites.	Anaemia disease.
4. Fleas.	External parasites.	Small pox.
5. Bilharzia worms.	Internal parasites.	Bilharziasis disease.

3
Unit

6 Comparisons

1. Between predation and parasitism.

Points of comparison	Predation	Parasitism
1. Definition :	It is a food relationship among living organisms, in which one living organism devours another one.	It is a food relationship between two different kinds of living organisms, where one benefits from the other and is known as the parasite, while the other is harmed and is known as the host.
2. Harms that occur to the host or prey :	The prey is killed in this relationship.	The host becomes weak.
3. Example :	The relation between a cat and a rat.	The relation between jawless lamprey and fish.

2. Between commensalism and parasitism.

Points of comparison	Commensalism	Parasitism
1. Definition :	It is a food relationship between two living organisms, where one of them benefits from the other, while the other neither gets benefit nor is harmed.	It is a food relationship between two different kinds of living organisms, where one of them benefits from the other and is known as the parasite, while the other is harmed and is known as the host.
2. Example :	The relation between sponge and the tiny aquatic living organisms.	The relation between bilharzia worms and man.

3. Between parasitism and saprophytism.

Points of comparison	Parasitism	Saprophytism
1. Definition :	It is a food relationship between two different kinds of living organisms, where one of them benefits from the other and is known as the parasite, while the other is harmed and is known as the host.	It is a food relationship in which saprophytes get their food by decomposing food remains or bodies of dead organisms.
2. Example :	The relation between tape worms and man	The relation between bread mold fungus and bread.

4. Between external parasitism and internal parasitism.

Points of comparison	External parasitism	Internal parasitism
1. The place, where the parasite lives :	The parasite lives externally on the host's body.	The parasite lives internally inside the host's body.
2. The food of the parasite :	The parasite feeds by sucking the blood of the host.	The parasite feeds by sharing the host its digested food or feeds on its cells and tissues.
3. Examples :	• Mosquitoes. • Lice. • Bugs.	• Bilharzia worm. • Ascaris worm. • Tape worm.

7 Important Points

1. Drosera and dionaea are examples for **insect-eaters plants**.
2. **Camouflage** and **mimicry** are ways of self-defence against predation.
3. **Mutualism**, **commensalism** and **parasitism** are types of symbiosis.
4. Mushroom fungus, bread mold fungus and penecillium fungus are examples for **saprophytes (decomposers)**.
5. An area of land or a water pond are examples for **small ecosystem**, while the universe is **a very large ecosystem**.
6. A forest, a desert or an ocean are examples for **large ecosystem**.
7. Factors harm (disturb) the environmental balance are : **Natural changes and man interference.**
8. The methods of man interference that lead to the disturbance of the environmental balance are :
   - **Cutting down trees.**
   - **Polluting environment.**
   - **Burning forests.**
   - **Eroding the soil.**
9. From the factors that keep the environmental balance are :
   - **Predation.**
   - **Saprophytism.**



Unit 1 Lesson 1

Test yourself 1

25

Answer each of the following questions :

1 Complete the following sentences : *(5 marks)*

1. .... is the light energy that can be seen.
2. The image formed in narrow holes is .... and ....
3. Air, clear water and glass cup are examples for .... , but .... and .... are examples for translucent materials.
4. .... is a darkened area which is formed as a result of falling light on an opaque object.
5. Light can transmit through .... and .... materials.
6. .... is not a source of light as it reflects the sunlight.

2 (A) Choose the correct answer: *(5 marks)*

1. Light transmits in .... lines.
   a. curved   b. broken   c. straight   d. zigzag
2. Formation of shadow when light falls on an object is due to ....
   a. travelling of light in straight lines.
   b. formation of images through narrow holes.
   c. transmitting light through transparent materials.
   d. all the previous reasons.
3. The materials which let most light pass through are called .... materials.
   a. transparent   b. translucent   c. semi-transparent   d. opaque
4. All the following are examples of semi-transparent materials except ....
   a. tissue paper.   b. frosted light bulbs.
   c. frosted glass cup.   d. foil paper.

(B) Write briefly about formation of shadow:

....

....

3 Write the scientific term: *(5 marks)*

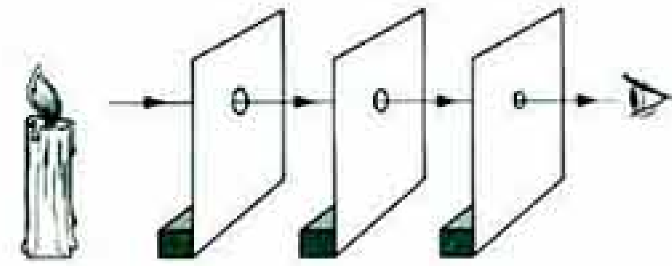
1. Materials which allow some light to pass through. (.........................)
2. The material that used to cover windows of darkened photographic rooms.
(.........................)



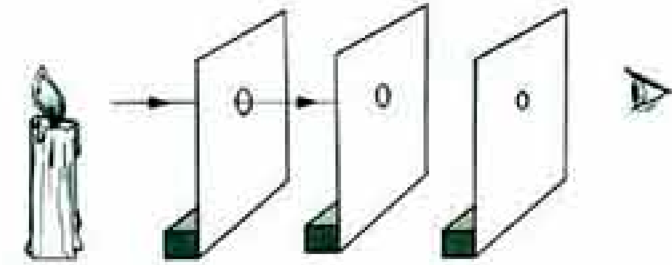
3. The main source of light on the Earth. (........................)
4. It is the darkened area which is formed as a result of falling light on an opaque object. (........................)
5. The materials, where things can be seen clearly through them. (........................)

4 **(A) Look at the opposite figures, then complete the following :** *(5 marks)*

1. Observation on figure (a):
....
....


Figure (a)

2. Observation on figure (b):
....
....


Figure (b)

3. General conclusion:
....
....

(B) Choose the odd material out, then write the type of the remaining materials:

1. Aluminium foil – Wood – Carton paper – Tissue paper.
   - The odd material : ....
   - The type of the remaining materials : ....
2. Wood – Glass – Air – Water.
   - The odd material : ....
   - The type of the remaining materials : ....

5 **(A) Compare between transparent , translucent and opaque materials.** *(5 marks)*
....
....
....
....
....

(B) What happens when ... ?

1. You look at a lightened candle through three screens containing holes, where the holes of screens are not on one straight line.
....
2. You look at a picture through a transparent material.
....

Unit 1 Lesson 1

25

Test yourself 2

Answer each of the following questions :

1 Complete the following statements: *(5 marks)*

1. The light bouncing when it falls on an object is called ....
2. When you stand at 40 cm. from a plane mirror, your image is formed at .... cm. from your body.
3. The reflection of light on a mirror surface is .... reflection, while reflection of light on a paper surface is .... reflection.
4. Light .... when it transfers between two different transparent media.
5. A rainbow is produced as a result of ....
6. The spectrum colours start with the .... colour and end with the .... colour.
7. .... and .... are the factors necessary for light reflection.

2 (A) Give reasons for: *(5 marks)*

1. Seeing the spoon bent when immersing it in a transparent cup of water.

....

2. Appearance of rainbow in the sky during rainfall.

....

....

3. You can see your image in a plane mirror.

....

(B) Write the use of :

1. Glass prism :

....

2. Opaque materials :

....

3 Choose the correct answer: *(5 marks)*

1. We can see objects due to ....
   a. light reflection. b. light refraction. c. absorption of light. d. splitting of light.
2. Mixing the seven light spectrum colours gives the .... light.
   a. white b. green c. blue d. black

3. The second spectrum colour is ....

a. red. b. orange. c. violet. d. green.

4. If you put an object at a distance of 20 cm. in front of the mirror, the distance between the image and the mirror equals .... cm.

a. 10 b. 40 c. 60 d. 20

5. A rainbow is formed when ....

a. sunlight passes from the drops of rain water to air, then its splitting into seven spectrum colours.

b. sunlight passes from air to water, then its splitting into seven colours.

c. sunlight doesn't pass through any medium.

d. sunlight passes through glass.

4 **(A) Put (✓) or (✗), then correct the wrong ones:** *(5 marks)*

1. Violet is the last colour in the spectrum colours. ( )

....

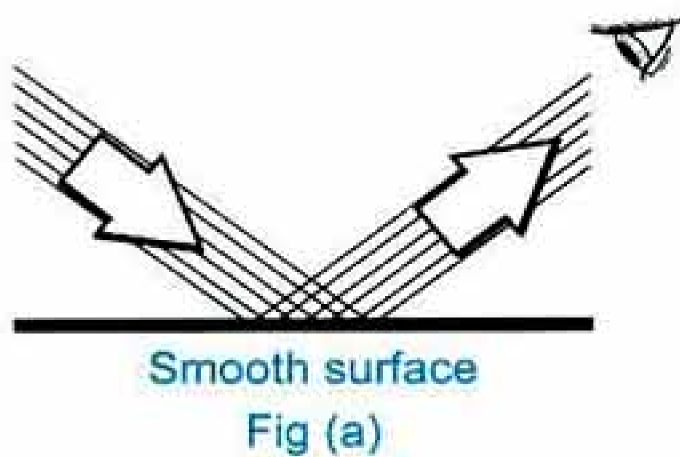
2. In the irregular reflection, the light rays are reflected directly in one direction. ( )

....

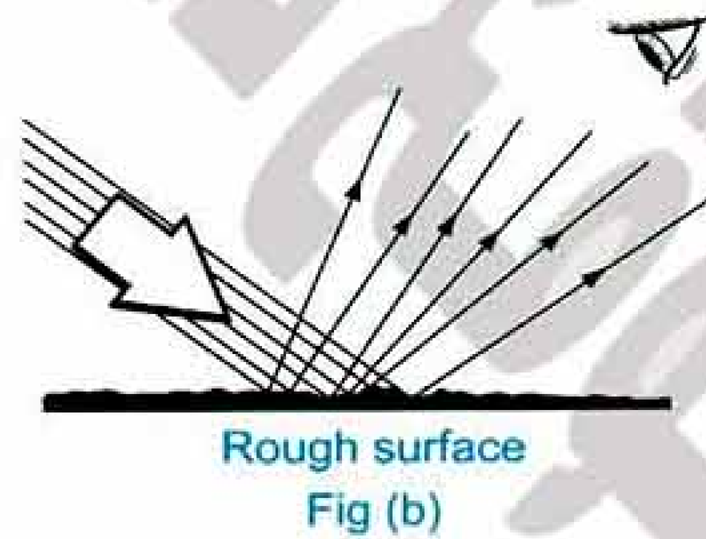
3. The change in the direction of light rays when they transfer through two different transparent media is called light reflection. ( )

....

(B) Look at the following figures, then complete the following:



Smooth surface
Fig (a)



Rough surface
Fig (b)

1. The two figures represent the .... of light.

2. In fig.(a), the light rays are reflected in one direction, so this is a .... of light.

3. In fig.(b), the light rays are reflected in different directions, so this is an .... of light.

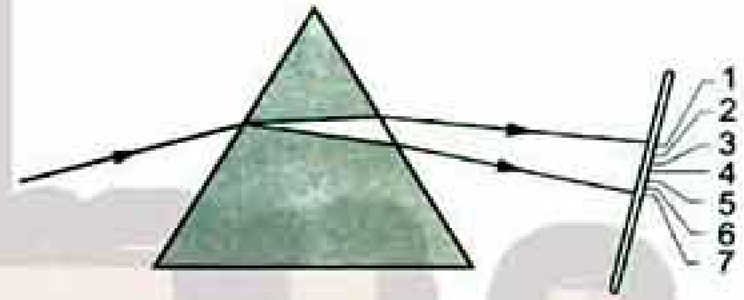
1 Part

5 (A) Write the scientific term: *(5 marks)*

1. It is the separation of white light into seven colours called spectrum colours. (..........................)
2. The change in the direction of light when it passes through two different transparent media. (..........................)
3. A beautiful phenomenon occurs in the sky during raining in a sunny day. (..........................)

(B) Look at the opposite figure which represents the glass prism , then complete the labels:

1. ....
2. Orange.
3. ....
4. ....
5. ....
6. ....
7. ....



Unit 1 Lesson 2

25

Test yourself 3

Answer each of the following questions :

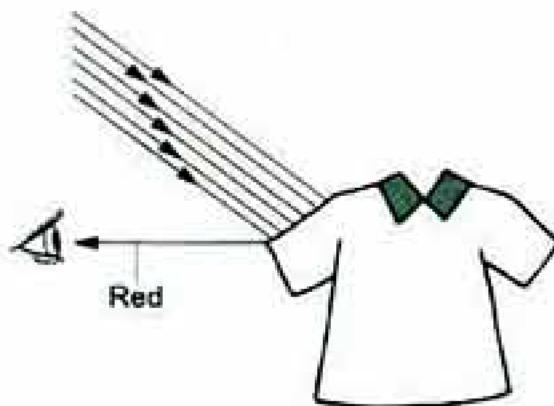
1 Complete the following statements: *(5 marks)*

1. Mixing the seven spectrum light colours produces the ....
2. .... objects seem having the same colour of the reflected light.
3. The strawberry fruit seems red, because it reflects .... only.
4. When white light strikes .... , it reflects all light colours, while when it falls on .... , it absorbs all light colours.
5. When white light strikes a banana fruit, it absorbs all light colours and .... the .... light only.
6. When white light falls on a blue translucent cup, the cup absorbs all light colours except ....
7. .... reflects its own colour only, while .... allows its own colour only to pass through it.

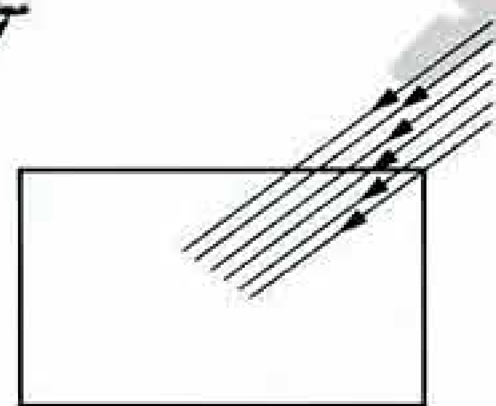
2 (A) Give reasons for each of the following: *(5 marks)*

1. We must wear white clothes in summer season.
   ....
2. The coloured transparent and translucent objects seem with the colour of the transmitted light through them.
   ....
   ....
3. We see the white object as it is.
   ....

(B) What is the colour of the body in each case?



.... (1) ....



.... (2) ....

1
Part

3 **Write the scientific term for each of the following:** *(5 marks)*

1. It is used to separate the visible light into seven spectrum colours. (..........................)
2. The objects that reflect all light colours that fall on them. (..........................)
3. The seven colours of light, where sunlight is made up of. (..........................)
4. The object that absorbs all the colours of light and permits its own colour only to pass through. (..........................)
5. The object that absorbs all light colours and reflects its own colour only. (..........................)

4 **(A) Put (✓) or (✗) :** *(5 marks)*

1. We see the coloured transparent body with the same colour, beacause it reflects all the light colours. ( )
....
2. The black opaque objects absorb all light colours and reflect their own colour only. ( )
....
3. The greeen table reflects all light colours. ( )
....

(B) What will happen when ... ?

1. White light strikes a strawberry fruit.
....
2. Yellow light strikes a black object. Why ?
....
....

5 **Choose the correct answer :** *(5 marks)*

1. When sunlight strikes a blue transparent glass sheet, the sheet appears ....
   a. yellow. b. black. c. red. d. blue.
2. The green glass bottle .... when white light falls on it.
   a. reflects all light colours
   b. absorbs all light colours and allows the green colour only to pass through
   c. absorbs all light colours d. reflects the green colour only
3. .... reflects all light colours.
   a. White opaque object b. Black opaque object
   c. Yellow opaque object d. Transparent object
4. The flower seems red, because it absorbs ....
   a. all light colours and reflects the red colour only.
   b. the red colour only. c. all light colours.
   d. red and green colours.
5. Transparent and translucent objects have the same colour of ....
   a. the absorbed light colour. b. the transmitted light colour.
   c. the reflected light colour. d. the refracted light colour.

Unit 1 Lesson 2

25

Test yourself 4

Answer each of the following questions :

1 Look at the following figures, then write your observation and your inference: *(5 marks)*

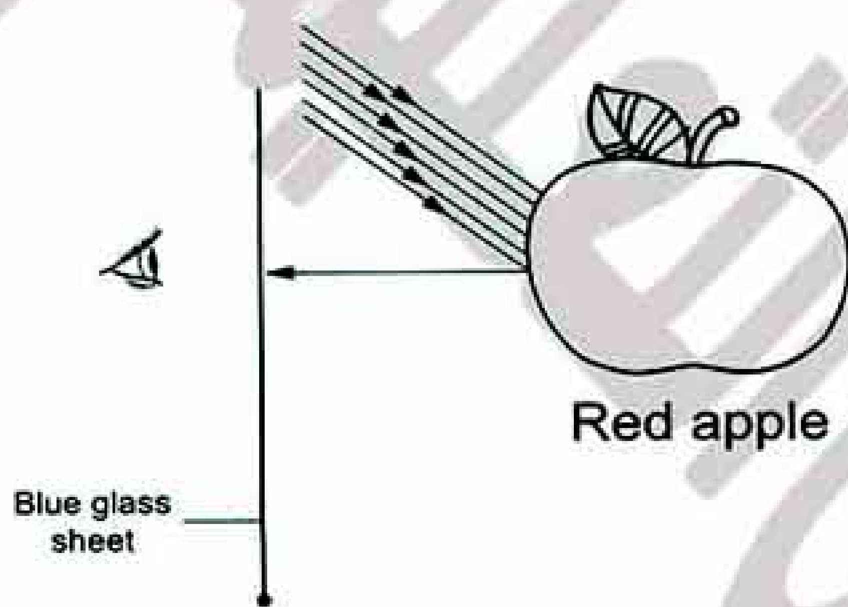


Fig.(a)

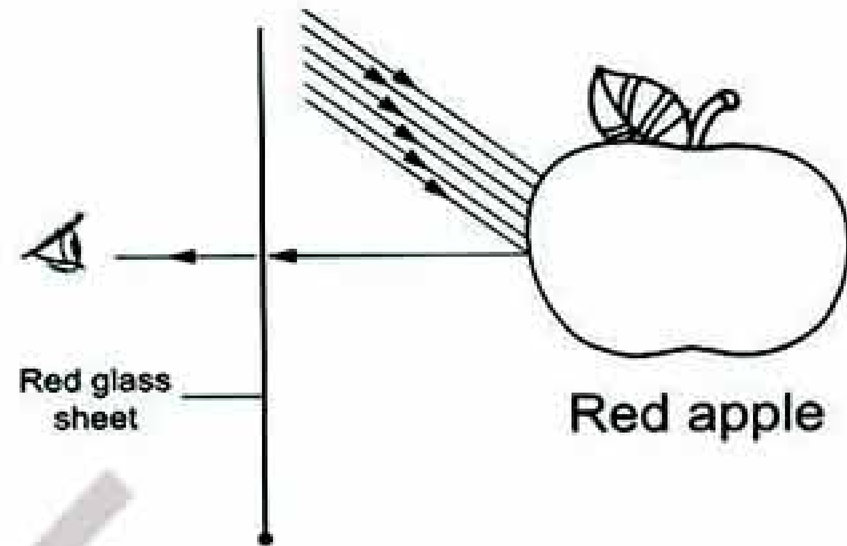


Fig.(b)

⇒ Observation on fig. (a) : ....

⇒ Observation on fig. (b) : ....

⇒ Inference : ....

....

2 Complete the following statements : *(5 marks)*

1. .... , ... and .... are the primary coloured lights.
2. .... , ... and .... are the secondary coloured lights.
3. Mixing .... and .... lights produces magenta light.
4. The red T-shirt seems red when you look at it from .... coloured glass sheet and it seems .... when you look at it from a violet glass sheet.

3 (A) Give reasons for each of the following: *(5 marks)*

1. Yellow, magenta and cyan are called secondary coloured lights.

....

2. Green colour is a primary coloured light.

....

3. The yellow banana appears black if you see it through a green transparent glass sheet.

....

....

(B) What happens when ... ?

1. Mixing blue and green light colours.

....

2. Mixing all the primary light colours.

....

4 Choose the correct answer: *(5 marks)*

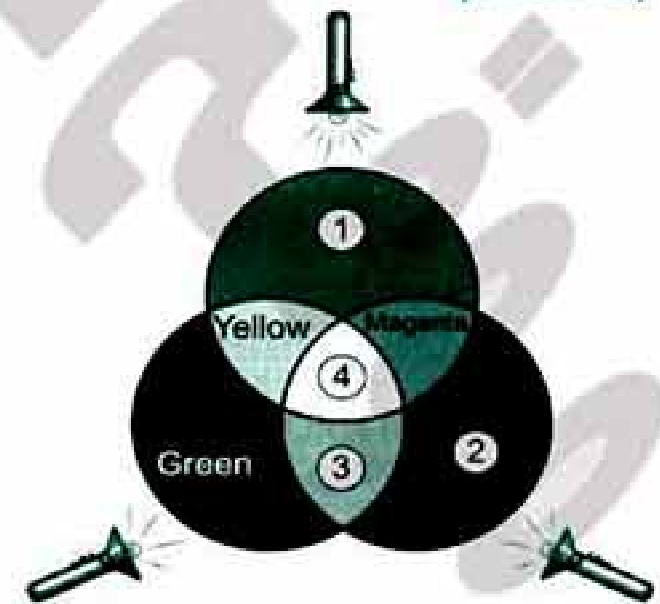
1. All the following coloured lights are primary lights except ....
   a. yellow. b. green. c. red. d. blue.
2. .... are coloured lights which impossible to be produced by mixing two of the other coloured lights.
   a. Secondary coloured lights b. Primary coloured lights
   c. Yellow and green d. Green and magenta
3. Mixing .... lights produces magenta light.
   a. red and green b. red and blue c. blue and green d. red and yellow
4. When you look at a red apple from a yellow glass sheet, the apple seems ....
   a. black. b. red. c. blue. d. yellow.
5. Which of the primary colours are mixed to produce yellow colour ? ....
   a. Red and green. b. Red and blue. c. Blue and green. d. Blue and cyan.

5 (A) Look at the opposite figure, then complete: *(5 marks)*

1. The three torches represent ....
2. Write the colour of each of the following number :

① .... ② ....

③ .... ④ ....



(B) Write the scientific term:

1. The light that is produced by mixing red, blue and green coloured lights. (.........................)
2. The coloured light that we can get by mixing two of the primary coloured lights. (.........................)

Unit 1 Lessons 1 & 2

Test yourself 5

25

Answer each of the following questions :

1 Choose the correct answer : (5 marks)

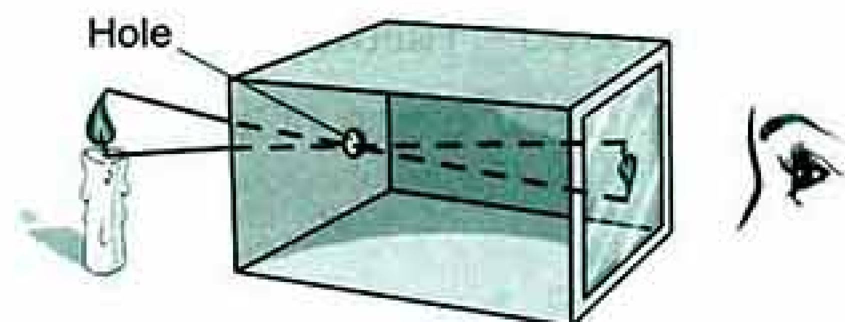
1. The whiteboard .... when white light falls on it.
   a. absorbs all light colours
   b. reflects all light colours
   c. refracts all light colours
   d. absorbs all light colours except blue
2. The .... object to the light source has the bigger shadow.
   a. farther
   b. nearer
   c. (a) and (b)
   d. no correct answer
3. Mixing red and blue lights gives .... light.
   a. yellow
   b. cyan
   c. magenta
   d. green
4. When you look in a mirror, you can see your image due to .... of light.
   a. regular refraction
   b. irregular refraction
   c. irregular reflection
   d. regular reflection
5. The blue transparent ruler appears .... when white light falls on it.
   a. black
   b. white
   c. blue
   d. cyan

2 (A) Give reasons for each of the following: (5 marks)

1. You can't see your pen if it is put behind your book.
   ....
2. When you look at an orange through a green glass sheet, the orange seems black.
   ....
   ....
3. Sunlight can be separated.
   ....

(B) Look at the opposite figure, then answer :

1. What is your observation ?
   ....
2. What is your inference ?
   ....



1 Part

3 **Complete the following statements :** *(5 marks)*

1. Yellow light is formed by mixing .... and .... light colours.
2. .... appears in the sky during rainfall due to .... of the Sunlight into seven spectrum colours.
3. Opaque objects have the same colour of the light that they ....
4. The light .... when it transfers between two .... transparent media.
5. The spectrum colour which comes before indigo is ....
6. A red apple appears .... through a red glass sheet, while it appears .... through a green glass sheet.

4 **(A) Put (✓) or (✗), then correct the wrong ones:** *(5 marks)*

1. Regular reflection is formed when light falls on a rough surface. ( )
   ....
2. Mixing red, green and yellow light colours produces the white light. ( )
   ....
3. Frosted glass is a transparent material. ( )
   ....

(B) Write the scientific term :

1. Reflect of light on the surface of a white paper in different directions. (..........................)
2. Material through which you cannot see objects. (..........................)

5 **(A) What happens when ... ?** *(5 marks)*

1. Putting a spoon in a glass of water.
   ....
2. Sunlight strickes a black T-shirt.
   ....
3. You place a transparent object between a source of light and a screen.
   ....

(B) Cross out the odd word :

1. Red - Yellow - Green - Blue. (..........................)
2. Clear glass - Clear water - Frosted glass - Transparent plastic. (..........................)

Unit 1 Lesson 3

Test yourself 6

25

Answer each of the following questions :

1 Complete the following statements: *(5 marks)*

1. The ancient Greeks discover black rocks in an area named .... , where these rocks attract materials made of ....
2. Magnetite is the .... magnet, while bar magnet is the .... magnet.
3. .... of magnet always points to the north direction of the Earth, but .... pole always points to the south direction of the Earth.
4. Aluminium, chalk and wood are .... , while nickel and cobalt are ....
5. Magnetism is concentrated at the .... , while it disappears at the .... of magnet.

2 (A) Give reasons for: *(5 marks)*

1. One of the magnetic poles is called north pole and the other is called south pole.
....
....
2. Iron is considered a magnetic substance.
....

(B) Mention the properties of magnet:

....
....
....
....

3 Choose the correct answer: *(5 marks)*

1. The natural magnet is one of the .... ores.
   a. copper b. iron c. aluminium d. carbon
2. When a magnet is suspended freely, its north pole is directed towards .... direction.
   a. north b. south c. east d. west
3. .... is attracted to the magnet.
   a. Chalk b. Glass c. Cobalt d. Plastic



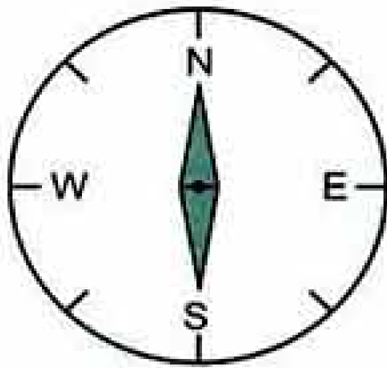
4. The region(s) of the magnet at which the magnetic force increases is (are) the .... of the magnet.
   a. midpoint b. two halves c. two poles d. (a) , (b) and (c)

5. The magnet is surrounded by an area called ....
   a. magnetic poles. b. magnetic field.
   c. non-magnetic materials. d. no correct answer.

4 **(A) Put (✓) or (✗), then correct the wrong ones:** *(5 marks)*

1. Aluminium is attracted to the magnet. ( )
   ....
2. The magnet has three poles. ( )
   ....
3. The natural magnet is a black rock. ( )
   ....
4. The south pole is usually blue-coloured, while the north pole is red-coloured. ( )
   ....

(B) What is the name of the following magnets ?





a. .... b. ....

5 **(A) When Ahmed approaches a strong magnet to samples of iron nails, small pieces of wood, nickel, plastic, cobalt and aluminium. He noticed that the iron nails and some other small pieces are attracted to the magnet, while the other pieces are not.** *(5 marks)*

Classify these samples into magnetic and non-magnetic materials :

Magnetic materials	Non-magnetic materials
....	....
....	....
....	....

(B) Cross out the odd word and give reason for your choice :

(Iron nails - Steel paper clips - Chalk - Cobalt)

• The odd word is ....
• Because ....

Unit 1 Lesson 3

25

Test yourself 7

Answer each of the following questions :

1 (A) Write the scientific term for each of the following: *(5 marks)*

1. The pole of the magnet that repels with the north pole of another magnet. (..........................)
2. The space around the magnet in which the effect of magnetic force appears. (..........................)

(B) What happens when ... ?

1. Passing a needle magnet through a piece of cork, then put it in a basin containing water.
   ....
2. You approach the north pole of a magnet to the south pole of another magnet.
   ....
3. You sprinkle some iron filings on the glass sheet which is put on a strong magnet, then knock on the glass slightly.
   ....
   ....

2 Complete the following statements : *(5 marks)*

1. Like magnetic poles .... each other, whereas dislike magnetic poles .... each other.
2. .... contains a small light magnet that moves freely around a ....
3. The English scientist .... made a magnetized needle which is used nowadays in making ....
4. Materials that are attracted to the magnet are called ....
5. .... is the ability of the magnet to attract .... materials existed in its field.
6. The greatest magnetic force is concentrated at .... of magnet.

3 (A) Give reasons for : *(5 marks)*

1. The compass is used to locate the main four geographical directions.
   ....
   ....

2. The north pole of the magnet attracts the south pole of another magnet, but repels the north pole.

....

....

3. The compass is an important tool for travellers.

....

(B) Put (✓) or (✗), then correct the incorrect ones:

1. The south pole of the compass always points to the west direction of the Earth. ( )

....

2. One of the applications of using the magnet in our daily life is the compass. ( )

....

4 (A) Choose the correct answer: *(5 marks)*

1. The compass contains .... magnet.
   a. horse-shoe b. bar
   c. small light magnetic needle d. ring
2. All the following are non-magnetic materials except ....
   a. copper. b. cobalt. c. aluminium. d. plastic.

(B) What is meant by magnetic force ?

....

....

5 (A) Compare between magnetic and non-magnetic materials. *(5 marks)*

....

....

....

....

(B) What are the composition (structure) and usage of compass ?

....

....

....

Unit 1 Lessons 1 , 2 & 3

Test yourself 8

25

Answer each of the following questions :

1 Complete the following statements: *(5 marks)*

1. .... and .... are non-magnetic materials.
2. The image formed through narrow holes of the camera is .... and ....
3. Light can pass through .... and .... materials.
4. The like magnetic poles .... , while the .... ones attract.
5. When light passes from water to air, it ....
6. When the magnet is hanged freely, it takes .... direction.

2 (A) What happens when ... ? *(5 marks)*

1. You put some iron nails close to the middle of the magnet.
   ....
2. Light falls on a shiny surface.
   ....

(B) Wrtie the scientific term :

1. Materials as iron, cobalt and nickel. (..........................)
2. The materials which allow the objects to be seen less clear behind them. (..........................)
3. A set consists of a mangnetic needle that can spin freely around a fixed axis. (..........................)

3 Choose the correct answer: *(5 marks)*

1. Shadow is a .... area that is formed, because light travels in straight lines.
   a. coloured b. white c. darkened d. yellow
2. The natural magnet is a .... rock.
   a. red b. blue c. green d. black
3. The glass prism is used to separate the white light into seven light colours called ....
   a. secondary colours. b. primary colours.
   c. spectrum colours. d. (a) and (b).

4. The .... pole of the magnet always refers to the south direction of the Earth.

a. north b. east c. west d. south

5. .... is the main source of light.

a. The Sun
b. Lightened candle
c. Kerosene lamp
d. Lightened electric lamp

4 (A) Give reasons for each of the following : *(5 marks)*

1. Formation of shadow.

....

2. It is preferable to wear white clothes in summer.

....

3. Some materials are called magnetic materials.

....

(B) Correct the underlined words :

1. The magnet has **three** poles. (.....................)

2. When the white light strikes a red rose, it reflects the **white** colour. (.....................)

5 (A) Choose from column (B) what suits it in column (A) : *(5 marks)*

(A)	(B)
1. Consists of seven spectrum colours	a. secondary coloured lights.
2. Red, green and blue	b. yellow colour is produced.
3. On mixing red and green	c. white light.
4. Yellow, magenta and cyan	d. primary coloured lights.
	e. magenta colour is produced.

1. .... 2. .... 3. .... 4. ....

(B) Mention the function of :

1. The compass :

....

2. The glass prism :

....



Unit 1 Lesson 4

25

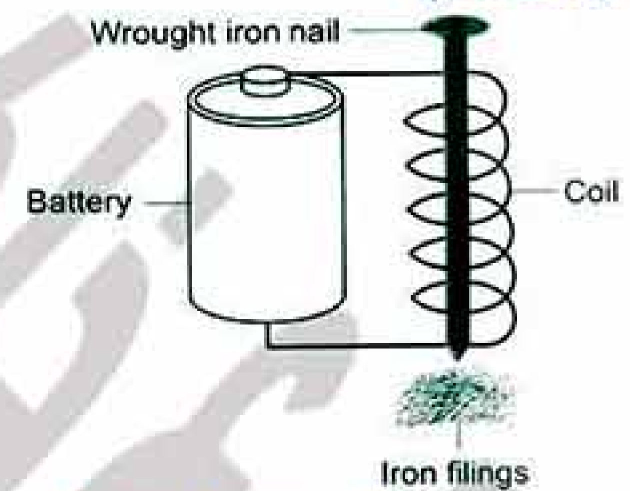
Test yourself 9

Answer each of the following questions :

1 Complete the following statements: *(5 marks)*

1. Generating the magnetic field by using the electric current is the idea of making ....
2. When you put an insulated wire connected with a battery beside a compass, the compass needle ....
3. .... is the magnet which is made by the effect of the electric current.
4. When an electric current flows through a wire twisted around a wrought iron bar, the bar becomes ....
5. In the electromagnet, ... energy changes into .... energy.
6. .... and .... are from the applications, where the electromagnet is used.
7. .... and .... increase the magnetic force of the electromagnet.

2 (A) Look at this figure, then mention your observation and your conclusion: *(5 marks)*



1. Observation : ....
....
2. Conclusion : ....
....

(B) Mention some of the devices in which the electromagnet can be used:

....
....

3 (A) Give reasons for: *(5 marks)*

1. It is preferable to increase the number of coil turns in the electromagnet.
....
2. The electromagnet is a very important device.
....
....
3. When an electric current flows through a wire that is put beside a compass, the compass needle deflects.
....
....



(B) How is the electromagnet used in lifting the heavy iron blocks ?

....
....
....
....
....

4 (A) Write the scientific term: *(5 marks)*

1. A structure made of a copper wire twisted around a wrought iron bar and the wire is connected to a battery. (..........................)
2. A device used to detect the magnetic effect of the electric current. (..........................)
3. A device used to convert the electric energy into magnetic energy. (..........................)
4. A huge instrument contains electromagnet and is used to lift scrap cars. (..........................)

(B) Mention the factors that increase the magnetic force of the electromagnet:

....
....

5 (A) Put (✓) or (✗) , then correct the wrong ones: *(5 marks)*

1. The magnetic energy can be generated by the electric current. (   )
....
2. Magnetism is always related to electricity. (   )
....
3. The magnetic force of the electromagnet increases by decreasing the number of batteries. (   )
....

(B) What happens if ... ?

1. The electric current flows through a coil winded around a wrought iron nail, then put this nail close to paper clips.
....
2. You cut the electric current from the electromagnet.
....

Unit 1 Lesson 4

Test yourself 10

25

Answer each of the following questions :

1 Choose the correct answer: *(5 marks)*

1. Dynamo changes the ....
   a. kinetic energy into magnetic energy.
   b. electric energy into magnetic energy.
   c. mechanical energy into electric energy.
   d. electric energy into mechanical energy.

2. The huge electric generator is used to ....
   a. generate electricity used for lightening cities.
   b. generate electricity used for operating factories.
   c. generate heat.
   d. (a) and (b).

3. The coil of a dynamo is made up of .... wire.
   a. carbon b. copper c. sulphur d. iron

4. .... discovers that "by moving a magnet in a coil, electric energy is generated".
   a. Faraday b. Newton
   c. El-Hassan Ibn El-Haitham d. Mosely

5. .... consists of a copper coil and a magnet.
   a. Horse-shoe magnet b. Dynamo
   c. Electromagnet d. Magnetic needle

2 (A) What happens when moving a copper wire between two poles of magnet ? *(5 marks)*

....

(B) Write one use for each of the following :

1. Electromagnet:

....

2. Dynamo:

....

3 **(A) Give reasons for each of the following:** *(5 marks)*

1. Dynamo changes the kinetic energy into electric energy.

....

2. The deflection of the ammeter's pointer increases by increasing the motion of coil between the two poles of magnet.

....

3. The huge electric generator is used in electric power stations.

....

....

(B) Mention the methods to increase the produced amount of electricity from the dynamo.

....

....

....

4 **Complete the following statements:** *(5 marks)*

1. .... and .... are examples of dynamo.
2. Moving a coil between the two poles of U-shaped magnet produces ....
3. The basic idea of the electric generator is changing of .... into ....
4. The electric current produced by the electric generator increases by .... or ....
5. The small dynamo of the bicycle consists of a .... connected with a magnet that is surrounded by ....
6. The magnet has .... effect.

5 **(A) Compare between natural magnet and electromagnet.** *(5 marks)*

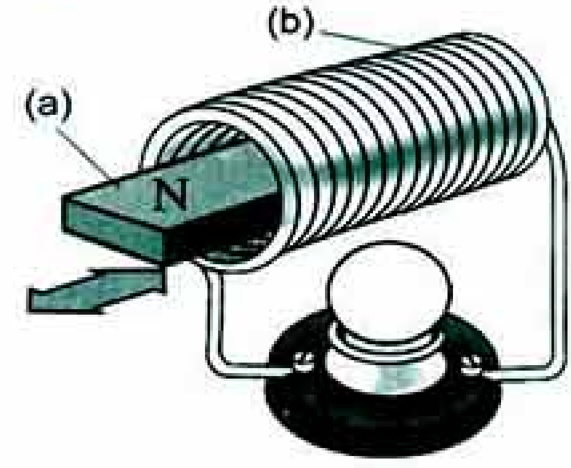
....

....

....

....

(B) Look at the opposite figure, then answer the following:



1. Moving (a) inside (b) produces ....
2. This figure represents the idea of making ....
3. In this figure, the .... energy changes into .... energy.
4. When the number of turns increases in (b), and (a) becomes huge, a large amount of .... is produced so, this structure is used in ....

General Exercise of the School Book on Unit 1

1 Use the following words to complete the sentences below :

poles - repel - attract - Unlike - magnetic field - compass - electromagnet - electric generator - motor - angle of incidence - angle of reflection.

1. The .... has a small light magnet moves freely around a fixed axis.
2. The .... is the space surrounding a magnet in which the magnetic force appears through.
3. The magnetic force is most powerful at the .... of the magnet.
4. Like poles .... each other.
5. .... poles attract.
6. When an electric current travels through a wire twisted around a wrought iron nail, the nail becomes an ....
7. A set that changes the mechanical energy into electrical one is known as an ....

2 Write the scientific term of each of the following sentences :

1. Reflection of light on the surface of white paper in different directions. (........................)
2. The materials that don't allow light to transmit through and objects can't be seen through. (........................)
3. The change of light rays directions when they transmit through the separating surface between two different transparent media. (........................)
4. The seven colours which the white light is made up of. (........................)
5. Red, green and blue light colours. (........................)
6. Yellow, purple and cyan light colours. (........................)
7. The materials that get attracted to the magnet. (........................)
8. The two ends of the magnet where the magnetic force is most powerful. (........................)
9. A set is used to change the mechanical energy to the electric one. (........................)

3 Put (✓) or (✗) and correct the wrong ones :

1. Light is a form of energy. ( )
....
2. A rainbow is formed when the Sun separates the moonlight. ( )
....
3. Light transmits in straight lines. ( )
....
4. Transparent objects have the same colour of the light that doesn't travel through. ( )
....
5. Opaque objects have the same colour of the light which the object reflects. ( )
....
6. Cyan, magenta and yellow are the primary colours. ( )
....
7. Mixing red, green and blue colours produces the white colour. ( )
....
8. Aluminium gets attracted to the magnet. ( )
....
9. An electric current can be generated by using a magnet. ( )
....
10. Magnetism is always related to electricity. ( )
....
11. An electromagnet is formed when an electric current passes through a compass. ( )
....

Model Exam 1 on Unit 1

25

Answer each of the following questions :

1 Choose the correct answer: *(5 marks)*

1. The ability of the magnet to attract the magnetic materials existed in its field is ....
   a. magnetic field.
   b. magnetic materials.
   c. non-magnetic materials.
   d. magnetic force.
2. The coloured opaque object seems with .... when we see it through transparent objects.
   a. the same colour
   b. black colour
   c. yellow colour
   d. the colour of the absorbed light
3. The electromagnet consists of ....
   a. wrought iron.
   b. copper wire.
   c. dynamo.
   d. (a) , (b) and battery.
4. The bouncing of light after falling on a piece of paper is ....
   a. a regular reflection.
   b. an irregular reflection.
   c. light refraction.
   d. light separation.
5. In an activity to prove that electric energy is generated by using a magnetic energy, the deflection of pointer of ammeter increases due to ....
   a. passing less electric current.
   b. passing more electric current.
   c. passing more light.
   d. passing less light.

2 Write the scientific term: *(5 marks)*

1. The materials which allow most light to pass through and objects can be seen clearly through them. (..........................)
2. Materials as copper, wood, leather and plastic. (..........................)
3. A device used in picking up steel blocks when the electric current passes through its coil and loses its magnetic force by cutting the electric current. (..........................)

4. A phenomenon appears in the sky during the rainfalling, and consists of different colours. (........................)
5. An object which reflects all light colours. (........................)

3 (A) Give reasons for each of the following: *(5 marks)*

1. We must wear dark clothes in winter.
....
2. When you approach a magnet to some paper clips, the clips are attracted to the two poles of the magnet.
....
....
3. The deviation of the ammeter's pointer when moving the copper wire between the two poles of a magnet.
....

(B) Mention how yellow, magenta and cyan are produced:
....
....
....

4 (A) Look at the following figures which represent three magnets, then complete the following questions : *(5 marks)*



Fig. (a)

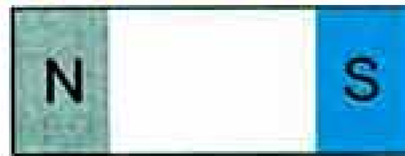


Fig. (b)

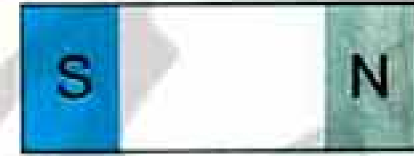


Fig. (c)

1. Magnets in figures (a) and (b), ... each other.
2. Magnets in figures (b) and (c), ... each other.
3. From the previous sentences, the .... poles repel, while .... poles attract.

(B) Put (✓) or (✗) :

1. The magnetic force is a visible force. ( )
2. When the white light strikes a violet rose, the rose reflects the white colour. ( )

1 Part

5 (A) Complete the following sentences : *(5 marks)*

1. Light can easily be transmitted through .... and .... materials.
2. As the light falls on the green grass, the grass must absorb all light colours except ....
3. The like poles .... each other, whereas the dislike poles .... each other.

(B) Amir wanted to increase the power of an electromagnet that he made. Which of the following achieves his aim ? ....

a. Replacing the copper insulated wire with another thinner and longer one.
b. Replacing the wrought iron nail with another one made of copper.
c. Replacing the wrought iron nail with another one made of steel.
d. Increasing the number of turns in the coil and the number of batteries.

Model Exam 2 on Unit 1

25

Answer each of the following questions :

1 Complete the following sentences : *(5 marks)*

1. Dynamo changes the .... energy into .... energy.
2. Mixing .... and .... coloured lights gives yellow colour.
3. The nearer object to the light source has the .... shadow.
4. Materials can be divided into .... and .... due to their magnetic abilities.
5. If the red light strikes a white ball, the ball looks in .... colour.
6. Sunlight is separated into .... colours by passing it through a ....

2 (A) Put (✓) or (✗) : *(5 marks)*

1. Image can be seen clearly behind carton. ( )
2. An electric current can be generated by using a magnet. ( )
3. Coloured opaque objects reflect their own colour only. ( )
4. Aluminium is attracted to the magnet. ( )

(B) What happens when ... ?

1. Seven spectrum light colours are mixed together.

....

2. A strong magnet is put close to a piece of wood.

....

3. Increasing the motion of coil between the two poles of a magnet in the dynamo.

....

3 Write the scientific term : *(5 marks)*

1. The lights that cannot be produced by mixing two other coloured lights. (..........................)
2. An instrument that is used to generate large amounts of electricity to lighten the cities and operate factories. (..........................)

3. It is the light energy that can be seen. (........................)

4. The regions of the magnet, where the magnetic force is most powerful. (........................)

5. A set that is used for locating the main four geographical directions. (........................)

4 **(A) Give reasons for each of the following :** *(5 marks)*

1. The box of compass isn't made from iron.
....
2. The magnet which is made by electricity is called electromagnet.
....
3. The formation of images through narrow holes.
....

(B) Correct the underlined words :

1. Disc drive and electric mixer contain **dynamo**. (........................)
2. The object seems black as it **reflects** all the light colours. (........................)

5 **(A) Choose the correct answer :** *(5 marks)*

1. We can see objects due to .... of light on them.
   a. reflection b. refraction
   c. shadow d. spectrum colours
2. When the magnet is hanged freely, it will take .... direction.
   a. north-west b. north-east c. north-south d. east-south
3. An orange appears .... when you look at it through a blue transparent glass sheet.
   a. red b. yellow c. green d. black

(B) From the opposite figure, answer the following :

(b)
(a)
N

1. Write the name of parts (a) , (b) :
   (a) .... (b) ....
2. Complete : When we move (a) inside (b), an .... is generated in the twisted wire, and .... the small light bulb.

Unit 2 Lesson 1

Test yourself 11

25

Answer each of the following questions :

1 Complete the following statements: *(5 marks)*

1. A substance that consists of only one type of identical particles is called ....
2. .... is a mixture of water and some minerals such as calcium and ....
3. .... is used to separate a soluble salt from its solution.
4. Components of a mixture can be separated by .... , ... , ... or evaporation process.
5. .... is used to separate water-oil mixture.
6. Solid materials can be mixed by .... or ....

2 (A) Write the scientific term: *(5 marks)*

1. A substance that consists of more than one type of particles. (...............)
2. A method used to separate iron objects from other solid substances in a mixture. (...............)
3. A process used to obtain table salt from its solution. (...............)

(B) Put (✓) or (✗), then correct the wrong ones:

1. Mixtures are formed by shaking, stirring or grinding. ( )
....
2. We use magnetic attraction to separate mixtures which contain precipitates. ( )
....

3 (A) Give reasons for each of the following: *(5 marks)*

1. Air is considered a mixture.
....
2. Both sugar and distilled water are considered pure substances.
....



1 Part

(B) Mention the steps that used to separate the components of a mixture of sand, salt and iron filings:

1. .... 2. ....

3. .... 4. ....

4 (A) Complete the following table: *(5 marks)*

Substance	Its type (mixture/pure substance)	Its components
1. Salty water.	....	....
2.	....	Water, calcium and magnesium.
3.	Pure substance.	Sodium chloride only.

(B) Examine the opposite figure, then complete the following :



1. The opposite apparatus is known as ....
2. This apparatus can be used to separate unmixed liquids such as .... mixture.
3. We can use this apparatus , ... , ... or .... to separate the components of mixtures.

5 (A) Mention one use for each of the following : *(5 marks)*

1. Stirring:

....

2. Filter paper :

....

(B) What happens when ... ?

1. Mix an amount of oil with water.

....

2. An amount of distilled water evaporates.

....

Unit 2 Lesson 2

25

Test yourself 12

Answer each of the following questions :

1 Complete the following: *(5 marks)*

1. .... + ... $\xrightarrow[\text{process}]{\text{.............}}$ Solution.
2. Mixtures formed by dissolving in liquids are .... mixtures.
3. The mixture of mud with water can be considered as ....
4. In chocolate milk solution, ... is the solute and .... is the solvent.
5. .... and .... increase the solubility speed.
6. .... is the liquid in which the solid substance dissolves.

2 (A) Write the scientific term for each of the following: *(5 marks)*

1. The substance that presents in the solution in a great amount. (........................)
2. The process of dissolving a solute in a solvent. (........................)
3. The mixture in which the particles of solute are suspended in the solvent. (........................)

(B) Mention the factors affecting the solubility process:

1. ....
2. ....
3. ....
4. ....
5. ....

3 (A) Choose the correct answer: *(5 marks)*

1. As .... decreases, the solubility time decreases.
   a. the amount of solvent
   b. the amount of solute
   c. heating
   d. stirring



2. .... is considered the most common solvent.

a. Benzene b. Vinegar c. Water d. Oil

3. Sugary solution is considered .... mixture.

a. a homogeneous b. a heterogeneous

c. a complex d. no correct answer

(B) Give reasons for each of the following:

1. Dissolving 50 gm. of sugar in one liter of water is faster than in half liter.

....

2. Solubility process depends on the temperature of the solution.

....

4 (A) Put (✓) or (✗), then correct the wrong ones : *(5 marks)*

1. Stirring increases the time of solubility. ( )

....

2. The mixture of sand and water is a homogeneous solution. ( )

....

3. In the homogeneous mixture, you can't distinguish between its components. ( )

....

(B) What is meant by ... ?

1. Solution : ....

....

2. Solvent : ....

....

5 **(A) Which of the following processes takes shorter time and why ?** *(5 marks)*

1. Dissolving 10 gm. of baking soda in 100 ml. of water

   Or : Dissolving 20 gm. in the same amount of water.

   ....

   Because : ....

   ....

2. Dissolving 30 gm. of sugar in 1 liter of water with stirring

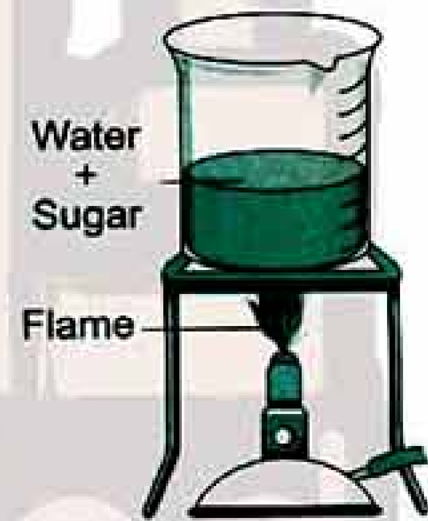
   Or : Dissolving the same amount of sugar in the same amount of water without stirring.

   ....

   Because: ....

   ....

(B) Look at the opposite figure, then answer:



1. This figure represents the effect of .... on the .... process.
2. As this factor increases, the solubility time ....

General Exercise of the School Book on Unit 2

1 Explain the following concepts :

1. The mixture.

....

2. The solution.

....

3. Solubility process.

....

2 Mention 3 mixtures:

....

....

....

3 Put (✓) in front of the correct statement and (✗) in front of the incrorrect one, then correct the underlined words if they are incorrect :

1. The components of **mixtures** can be separated. ( )

....

2. Solubility speed **decreases** by shaking and rising the temperature. ( )

....

3. The solubility speed of solids **increases** by grinding. ( )

....

4. Increasing the amount of the solvent **decreases** the speed of solubility. ( )

....

5. Mixtures **can be** separated by the magnetic attraction, filtration and evaporation. ( )

....

6. Separating funnel is used to separate the **heterogeneous liquid mixture**. ( )

....

4 Which of the following processes takes place faster and why ?

1. Evaporation of an amount of sea water by leaving it in a beaker in sunlight for several days or heating the same amount on the burner.

....
....

2. Grinding of solids before adding them to a liquid to dissolve or breaking them down into small pieces.

....
....

3. Dissolving of sugar grains in water or sugar cubes in water.

....
....

4. Dissolving of an amount of salt in a beaker containing 100 ml. of water or the same amount of salt in 300 ml. of water.

....
....

5 State the solvent and solute in each of :

Solution	Solute	Solvent
1. Sugary solution.	....	....
2. Salty solution.	....	....

6 Show how can the following mixtures be spearated :

1. Water contains mud.

....
....

2. Water contains sand.

....
....

1 Part

3. Salty solution.

....

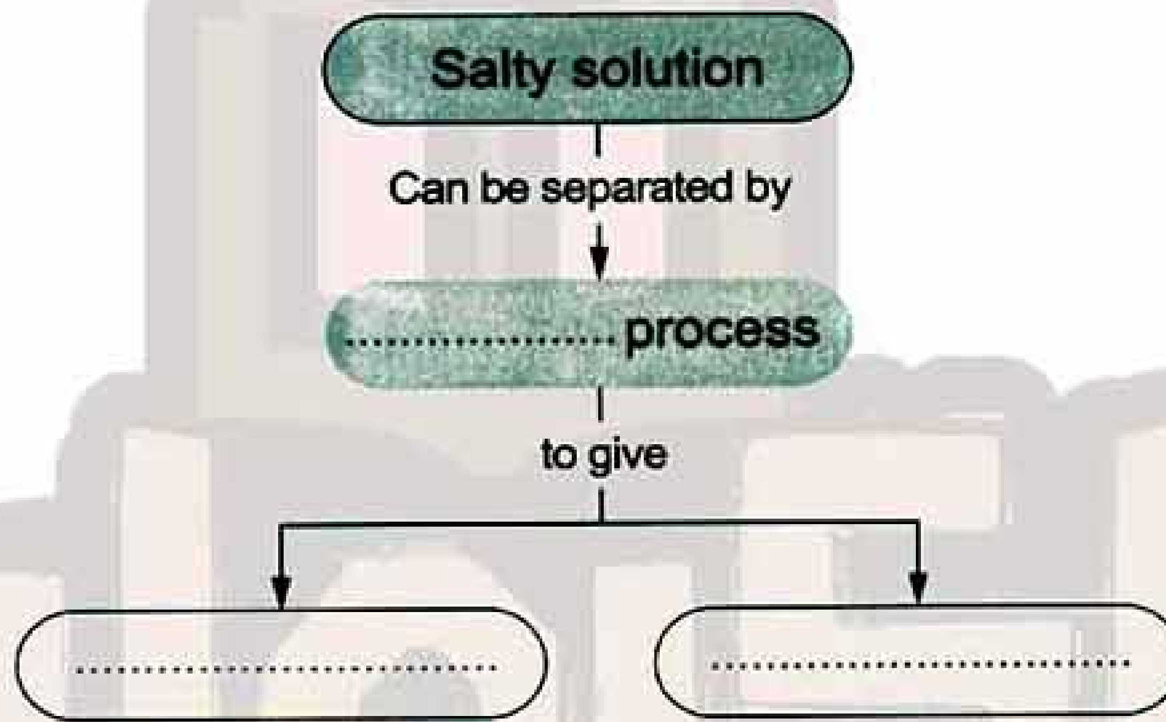
....

4. Sugary solution.

....

....

7 Complete the following concept map :



Model Exam 1 on Unit 2

25

Answer each of the following questions : *(5 marks)*

1 **(A) Sugar cubes and powdered sugar are added to same amount of water, then stir as shown in the opposite figures :**

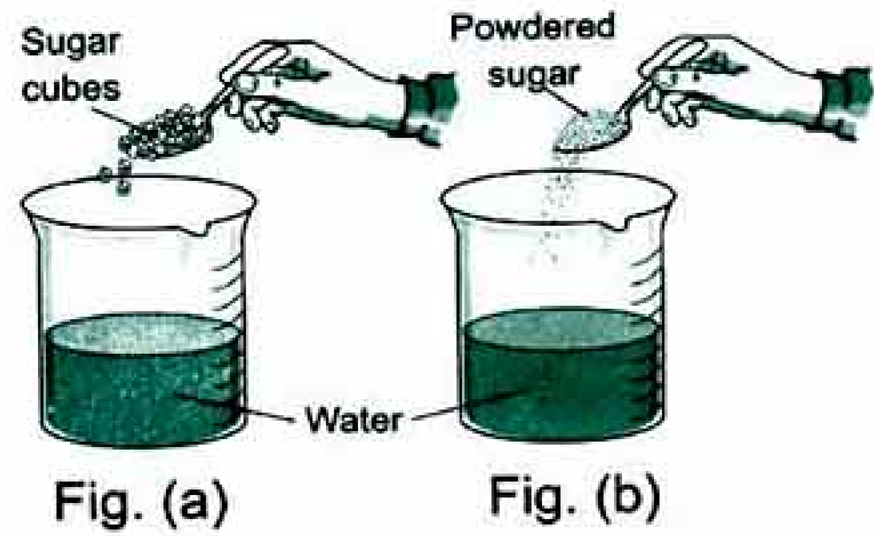


Fig. (a) Fig. (b)

Which statement is true ?

a. Sugar cubes will dissolve faster.

b. Powdered sugar will dissolve faster.

c. Both of them will dissolve in the same amount of time.

- Give reason for your answer.

....

....

(B) How can you separate a mixture of salt and iron filings ?

....

....

2 **Complete the following sentences :** *(5 marks)*

1. The components of .... mixtures can be distinguished, while the components of .... mixtures can't be.
2. A mixture of mango juice and milk can be formed by .... or ....
3. .... is an example of solid-solid mixture, while .... is a gaseous-liquid mixture.
4. Stirring a mixture of water and sugar .... , while grinding the solid materials ....
5. Mixing a small amount of mud with water forms .... that can be separated by ....

3 **(A) Give reasons for :** *(5 marks)*

1. Dissolving sugar in hot water is faster than that in cold water.

....

2. Evaporation process is used to separate table salt from its solution.

....

3. Solution is a type of mixtures.

....

1 Part

(B) How can you separate coffee from water ?

....

4 Choose the correct answer: *(5 marks)*

1. All these methods are used to form mixtures except ....
   a. shaking process. b. stirring process.
   c. grinding process. d. magnetic attraction.
2. Increasing the quantity of solute when using the same amount of solvent leads to ....
   a. increasing the solubility time. b. increasing the solubility process.
   c. preventing the solubility process. d. no change in the solubility time.
3. To separate insoluble matter (sand) from salty solution, we use ....
   a. filtration process. b. evaporation process.
   c. separating funnel. d. grinding process.
4. All the following are pure substances except ....
   a. distilled water. b. sugar. c. baking soda. d. tomato sauce.
5. .... is from liquid-liquid mixtures.
   a. A mixture of vinegar and water b. A mixture of sand and water
   c. A mixture of lettuce, carrots and tomatoes d. Air

5 (A) You have an amount of salt mixed with an amount of sand and an amount of water. Arrange the following steps to separate the components of this mixture: *(5 marks)*



Filtration
Fig. (1)
....


Stirring
Fig. (2)
....


Evaporation
Fig. (3)
....

(B) From the previous figures, mention :

1. The solute and the solvent.
   ....
2. The effect of the step in fig. (2) in solubility process.
   ....

Model Exam 2 on Unit 2

25

Answer each of the following questions :

1 (A) Write the scientific term : *(5 marks)*

1. A process used to obtain sugar from sugary solution. (..........................)
2. A mixture in which the solute breaks down into its most basic particles that spread throughout the solvent. (..........................)
3. A mixture whose components can be distinguished from each other. (..........................)

(B) Mention the method that is used to :

1. Separate salt from salt solution. (..........................)
2. Separate sand from water. (..........................)

2 Complete the following : *(5 marks)*

1. Air is a mixture of .... , ... , water vapour and nitrogen.
2. Mineral water is a .... which consists of water and minerals such as .... and magnesium.
3. .... process is used to separate sand from water.
4. The solution consists of .... and .... which are mixed by .... process.
5. In salty solution, salt is the ...., while water is the ....

3 Choose the correct answer: *(5 marks)*

1. To separate iron filings from sand, we must use ....
   a. a magnet. b. a separating funnel.
   c. evaporation process. d. filtration process.
2. All these methods are used to separate mixtures except ....
   a. magnetic attraction. b. filtration process.
   c. evaporation process. d. shaking process.
3. Oil-water mixture can be separated by using ....
   a. a filter paper. b. a strong magnet.
   c. a separating funnel. d. the evaporation process.



4. All the following are examples of homogeneous liquid mixtures except ....

a. apple juice.
b. orange juice.
c. tea.
d. sugar solution.

5. The substance in which solids dissolve is called ....

a. solubility process.
b. solvent.
c. solute.
d. sugar.

4 (A) Give reasons for the following : *(5 marks)*

1. Mineral water is considered as a mixture.
....
2. A mixture of sand and iron filings can be separated easily.
....
3. Mud in water is a heterogeneous mixture.
....
4. Salt dissolves easily and faster in a large amount of water.
....

(B) How does temperature affect the solubility process ?

....

5 (A) Put (✓) or (✗), then correct the wrong ones : *(5 marks)*

1. The properties of the mixture are the same properties of its components. (   )
....
2. Solute + Solvent $\xrightarrow[\text{Process}]{\text{Solubility}}$ Solution. (   )
....

(B) Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Stirring	a. used to separate the soluble solid materials.
2. Filtration	b. used in making the solution.
3. Evaporation	c. used to separate the insoluble solid materials.

1. .... 2. .... 3. ....

Unit 3 Lesson 1

25

Test yourself 13

Answer each of the following questions :

1 Complete the following statements: *(5 marks)*

1. Predation is less common in .... world than in .... world.
2. Camouflage phenomenon is found in some living organisms such as .... and ....
3. .... ejects a black substance in water when attacked by enemies.
4. Bees which look like wasps undergo .... phenomenon, while chameleon undergoes .... phenomenon to protect themselves from their enemies.
5. There are three types of symbiosis which are .... , ... and ....

2 Choose the correct answer: *(5 marks)*

1. The devoured animal by another animal is known as the ....
   a. saprophyte. b. parasite. c. prey. d. predator.
2. .... can change its colour to be hidden from its enemies.
   a. Frog b. Ascaris worm c. Bee d. Sponge
3. .... ejects a black fluid in the surrounding water to hide from its enemies.
   a. Frog b. Cuttlefish c. Butterfly d. Chameleon
4. .... is a phenomenon in which the harmless living organisms imitate other harmful or poisonous living organisms to fear their enemies and escape from them.
   a. Mimicry b. Mutualism c. Symbiosis d. Camouflage
5. The relation between nodular bacteria and leguminous plants is ....
   a. mutualism. b. camouflage. c. mimicry. d. predation.

3 (A) Correct the underlined words: *(5 marks)*

1. In predation, the harmed organism is known as the predator.
   (..........................)
2. Some bees appeal to mutualism relationship to escape from them.
   (..........................)

(B) Mention the kind of food relationship between each of the following:

1. A lion and a deer. (..........................)
2. Drosera plant and insects. (..........................)
3. Nodular bacteria and leguminous plants. (..........................)

4 Write the scientific term: *(5 marks)*

1. A temporary food relationship which ends up by devouring the prey or a part of it. (..........................)
2. A phenomenon in which the living organism protects itself from enemies by changing its colour to simulate the colours of its surrounding environment. (..........................)
3. A living organism use camouflage phenomenon to hide from its enemies by ejecting a black fluid in the surrounding water. (..........................)
4. A method used by a bee to fear its enemies. (..........................)
5. A food relationship in which, each organism gets benefit (in the form of food) from the other. (..........................)

5 (A) Give reasons for : *(5 marks)*

1. Some plants are known as insectivorous plants.

....

2. Sepia ejects a black fluid in the surrounding water.

....

....

....

3. Some bees look like wasps in forming stripes on their bodies.

....

(B) Explain the mutualism relationship between leguminous plants and nodular bacteria.

....

....

....

Unit 3 Lesson 1

25

Test yourself 14

Answer each of the following questions :

1 Choose the correct answer: (5 marks)

1. The relationship between sponge and the tiny aquatic living organisms is known as ....
   a. mutualism. b. commensalism. c. predation. d. parasitism.
2. Mosquitoes cause .... disease to man.
   a. elephantiasis b. small pox c. malaria d. bilharziasis
3. All the following are external parasites except ....
   a. lice. b. ticks. c. lamprey. d. liver worm.
4. Fleas convey .... disease to man.
   a. malaria b. small pox c. bilharzia d. anaemia
5. Saprophytes are .... organisms.
   a. parasitic b. autotrophic c. decomposer d. (a), (b) and (c)

2 Put (✓) or (✗), then correct the wrong ones: (5 marks)

1. Some living organisms hide from enemies by changing their colour to simulate the colours of their surrounding environment. ( )
   ....
2. The relation between sponge and the tiny aquatic living organisms is saprophytism. ( )
   ....
3. In parasitism, the organism that is harmed is known as the host. ( )
   ....
4. Filaria worm causes small pox disease to man. ( )
   ....
5. Saprophytes as bread mold fungus get their food by killing the prey. ( )
   ....

3 Write the scientific term: (5 marks)

1. The disease caused by the parasitic ascaris worms. (..............)

2. The parasitic worm that causes bilharziasis disease. (........................)
3. A parasite can convey small pox disease to man. (........................)
4. The parasite that conveys diseases to the host as it shares the host its digested food. (........................)
5. A food relationship in which saprophytes get their food by decomposing food remains or bodies of dead organisms. (........................)

4 **(A) Compare between commensalism and parasitism:** *(5 marks)*

....
....
....
....

(B) Mention the kind of food relationship between:

1. Bilharzia worms and man. (........................)
....
2. Jawless lamprey and fish. (........................)
....

5 **(A) Give the name of the parasite that causes the following diseases:** *(5 marks)*

1. Elephantiasis.
....
2. Malaria.
....

(B) Give reasons for:

1. The relation between spong and the tiny aquatic living organism is commensalism.
....
2. Host death is considered a loss for the parasite.
....
3. Parasitism relationship differs from the predation relationship.
....
....

Unit 3 Lesson 2

25

Test yourself 15

Answer each of the following questions :

1 Complete the following statements: *(5 marks)*

1. Bodies of living organisms contain some chemical elements such as .... and ....
2. Some human activities such as .... and .... cause the disturbance of the environmental balance.
3. .... and .... are from saprophytic organisms.
4. Predators help preys to get rid of .... or .... members.
5. The components of ecosystem are .... and ....

2 (A) What happens if ... ? *(5 marks)*

1. Chemical elements are not recycled by saprophytic organisms in the ecosystem.

....

2. Predators disappear from an environment including few rabbits.

....

....

3. Cutting down of trees.

....

....

(B) Put (✓) or (✗) :

1. Predators organize the numbers of preys' populations. (   )
2. Ecosystem may be very large as the universe. (   )
3. Interference of man leads to environmental balance. (   )
4. Saprophytic organisms recycle chemical elements within the ecosystem. (   )

3 Write the scientific term: *(5 marks)*

1. The relationship which helps preys' populations to get rid of weak or sick members. (.........................)

1 Part

2. The phenomenon which appears among preys' population due to the shortage of food resources in the ecosystem. (..........................)

3. A natural area including living organisms and non-living things. (..........................)

4. The organisms which organize the numbers of preys' populations in the ecosystem. (..........................)

5. The phenomenon that had been occured to dinosaurs in ancient eras due to changing of natural conditions. (..........................)

4 **(A) What is meant by ... ?** *(5 marks)*

1. Ecosystem : ....

....

2. Environmental balance : ....

....

(B) How has man benefited from saprophytic organisms in industry ?

1. ....
2. ....
3. ....

5 **Choose the correct answer:** *(5 marks)*

1. If there were no predators, preys' populations would ....
   a. disappear. b. become weak.
   c. increase in number. d. die.
2. All the following are large ecosystems except the ....
   a. desert. b. bond. c. forest. d. sea.
3. All the following are living organisms of an ecosystem except ....
   a. insects. b. plants. c. air. d. birds.
4. Predation relationship plays an important role in keeping .... in the ecosystem.
   a. preys' numbers b. shelters
   c. food resources d. saprophytes' numbers
5. Without the saprophytic organisms, the Earth's surface would be covered with ....
   a. plants. b. living organisms. c. animals. d. dead organisms.

General Exercise of the School Book on Unit 3

1 Complete the following sentences :

1. The interaction between a cat and a rat is an example of ....
2. Fungi are considered as .... living ogranisms.
3. Bilharzia worms parasitize on .... and are known as .... whereas the harmed organism is known as ....

2 Choose one of the following terms to complete the following sentences :

(snake - wheat - sheep - rat - predation)

1. The producer is ....
2. The predator is ....
3. The herbivorous are .... and ....
4. The relationship between a snake and a rat is known as ....

3 Put (✓) or (✗) :

1. Fungi feeding on the dead organisms bodies are called saprophytes. ( )
2. Among the different types of fungi, mushroom is distinguished by its ability to make its food. ( )
3. Spiders use their woven nets for catching insects. ( )

4 Give reasons for the following :

1. Plants are the main food for lions, although lions are carnivorous.

....

2. Tape worm is a parasite.

....

5 What is the effect of saprophytes on the environmental balance ?

....

....

....

6 What is meant by ... ?

1. Ecosysystm.

....

1 Part

1. Environmental balance.

....

7 Choose the correct answer:

1. Green plants are considered as .... organisms.
   a. decomposer b. producer c. consumer
2. An example of decomposers is the ....
   a. fungi. b. rabbits. c. plants.
3. Plants get energy from ....
   a. oxygen. b. chlorophyll. c. sunlight.
4. The process of photosynthesis is done by a .... living organism.
   a. producer b. decomposer c. consumer
5. Bilharzia worms are considered as .... organisms.
   a. producer b. parasitic c. decomposer

8 Write the scientific term that expresses each of the following sentences :

1. A temporary relationship between two different living organisms that benefits one and harms the other. (..........................)
2. A relation between two living organisms that benefit from each other. (..........................)
3. A food relation between two living organisms that one benefits and the other doesn't benefit or harm the first one. (..........................)

9 What happens when ... ?

1. Herbivorous (as rabbits) decrease in the environment.

....

2. Food producers (as green plants) decrease in the environment.

....

3. Man continues cutting forest trees.

....

4. Bacteria completely disappear.

....

5. Predators disappear from an environment including few rabbits.

....

Model Exam 1 on Unit 3

....
25

Answer each of the following questions :

1 Write the scientific term: *(5 marks)*

1. The temporary food relationship that ends by devouring the prey or a part of it. (..........................)
2. The phenomenon that had occurred to dinosaurs in ancient eras due to changing of natural conditions. (..........................)
3. The organisms which clean the Earth's surface from dead bodies. (..........................)
4. A phenomenon in which the harmless living organisms imitate other harmful or poisonous living organisms to frighten their enemies and escape from them. (..........................)
5. The parasite lives inside the host's body and shares the host its digested food or feeds on its cells and tissues. (..........................)

2 Mention the relation between each of the following : *(5 marks)*

1. Plants and animals. (..........................)
2. Ascaris worm and man. (..........................)
3. Drosera plant and insects. (..........................)
4. Sponge and the tiny aquatic living organisms. (..........................)
5. Lion and deer. (..........................)

3 Complete the following sentences : *(5 marks)*

1. Some autotrophic plants prey insects to get their required elements for making ....
2. The food relationship in which, both organisms get benefit from each other is known as ....
3. Bodies of living organisms contain some chemical elements as .... , ... and phosphorus that return back to the environment with the help of .... organisms.

1
Part

4. Ecosystem is any .... area that contains .... and ....

5. The interaction between a cat and a rat is considered as an example of ....

6. Fleas can convey .... disease to man, while ascaris worm causes .... to him.

4 Look at the opposite figure, then answer the following questions : *(5 marks)*



1. What is the food relationship between the plant and the insect ?

....

2. Why does this plant feed on the insects ?

....

3. After the death of this plant, some organisms called saprophytic organisms feed on the remains of the plant.

Mention the role of these organisms to keep the environmental balance.

....

....

....

5 Choose the correct answer: *(5 marks)*

1. The relation between nodular bacteria and bean plant is ....

a. predation. b. parasitism. c. mutualism. d. mimicry.

2. .... is a food relationship in which the organism gets its food by decomposing food remains or bodies of dead organisms.

a. Saprophytism b. Parasitism c. Camouflage d. Mimicry

3. Predation relationship .... the numbers of the preys in populations.

a. increases b. organizes c. decreases d. prevents

4. Due to the shortage of food resources, ... appears among preys populations.

a. predation b. symbiosis c. competition d. mutualism

5. .... is the phenomenon in which a harmless living organism imitates other harmful living organism.

a. Mimicry b. Symbiosis c. Camouflage d. Mutualism

Model Exam 2 on Unit 3

....
25

Answer each of the following questions :

1 Choose the correct answer : *(5 marks)*

1. Which of the following is a very large ecosystem ? ....
   a. The ocean. b. The water pond. c. The desert. d. The universe.
2. The ogranism which is harmed is called the .... in the parasitism relationship.
   a. parasite b. prey c. host d. saprophytic
3. .... are considered decomposers.
   a. Fungi b. Plants c. Bacteria d. (a) and (c)
4. Cutting trees to build houses causes the environmental ....
   a. balance. b. disturbance. c. envelope. d. camouflage.
5. From the chemical elements which is (are) recycled by saprophytic organisms ....
   a. carbon. b. phosphorus.
   c. nitrogen. d. all the previous answers.

2 (A) Give reasons for : *(5 marks)*

1. Some plants eat tiny insects.
   ....
2. A frog can change its colour.
   ....
3. The extinction of dinosaurs in anicent eras.
   ....

(B) Write the scientific term :

1. The balance among the components of the ecosystem. (....................)
2. An example of a living organism that disappears due to the disturbance of the environment. (....................)

3 (A) Compare between predation and parasitism : *(5 marks)*

....

....

....

....

(B) Put (✓) or (✗) :

1. Bilharzia worm is external parasite and lice are internal parasites. ( )
2. Changing the natural conditions leads to the environmental balance. ( )

4 (A) Choose from column (B) what suits it in column (A) : *(5 marks)*

(A)	(B)
1. A food relationship between man and liver worm	a. predation.
2. A food relationship between bean plant and nodular bacteria	b. externally parasitism.
3. A food relationship between cat and rat	c. commensalism.
4. A food relationship between fungi and splashed bread	d. saprophytism.
	e. internally parasitism.

1. .... 2. .... 3. .... 4. ....

(B) Complete the following sentences :

1. .... is the food relationship that organizes the numbers of preys in populations.
2. Saprophytic organisms .... the chemical elements within the ecosystem.

5 (A) What happens when ... ? *(5 marks)*

1. A chameleon is attacked by enemies.

....

2. A cuttlefish is attacked by enemies.

....

(B) Classify the following into internal parasites and external parasites :
(Lice - Ascaris worm - Liver worm - Bugs - Mosquitoes - Tape worm)

– Internal parasites :

....

– External parasites :

....

Final Exams 2019

PART TWO

28 Final Exams of some Schools Governorates.

2
Part

1 Cairo Governorate

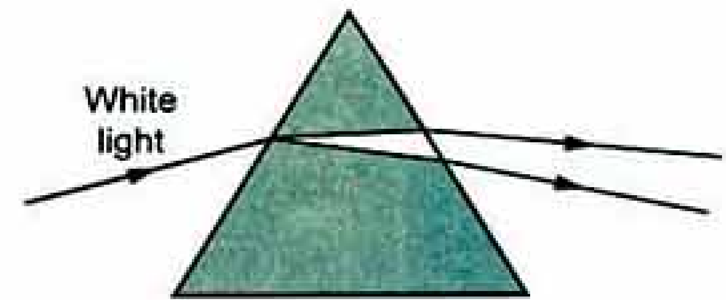
Misr El-Gadida Educational Zone
St. Joseph's School

Answer the following questions :

1 [A] Put (✓) or (✗) :

1. Filtration is used to separate iron nails from sand. ( )
2. The balance of ecosystem occurs due to the interface of man. ( )
3. Yellow light colour is an example of primary colours. ( )
4. An electric current can be generated by using a magnet. ( )

[B] Look at the opposite figure :



1. What is the name of the device ?

....

2. Mention its function.

....

[C] Give reasons for :

1. Bilharzia worm is a parasite.

....

2. The moon is not considered as a source of light.

....

2 [A] Write the scientific term :

1. The disease caused by some types of mosquitoes and infects the man. (..................)
2. The natural area includes living organisms and non-living things. (..................)
3. A darkened area formed behind an object once light falls on it. (..................)
4. The instrument used to separate oil from water. (..................)

[B] Choose the correct answer :

1. Mixing blue light colour with red light colour produces .... light colour.
   a. magenta b. cyan c. yellow
2. The food relationship between tiny aquatic organisms and sponge is an example of ....
   a. parasitism. b. commensalism. c. mutualism.
3. The parasite that causes anaemia to man is ....
   a. ascaris worm. b. filaria worm. c. liver worm.
4. The area around the magnet where magnetic force appears in it , ...
   a. magnetic poles. b. magnetic field. c. magnet.

3 **[A] Complete the following statements :**

1. The solution consists of .... and ....
2. .... and .... are some ways of self-defence against predation.
3. .... is used to pick up the huge blocks of iron, while .... is used to generate electricity in bicycle.
4. Increasing .... reduces solubility time, while we use .... as a common solvent.

[B] What is meant by ... ?

1. Irregular reflection.

....

2. Solvent.

....

[C] What happens when ... and give reasons ?

1. You look at the spoon in a beaker contains water.

....

2. When the north pole of a magnet gets near to the north pole of another magnet.

....

4 **[A] Choose from column (B) what suits it in column (A) :**

(A)	(B)
1. External parasite as	a. a mixture.
2. Internal parasite as	b. a pure substance.
3. Distilled water is	c. liver worm.
4. Mineral water is	d. bug.

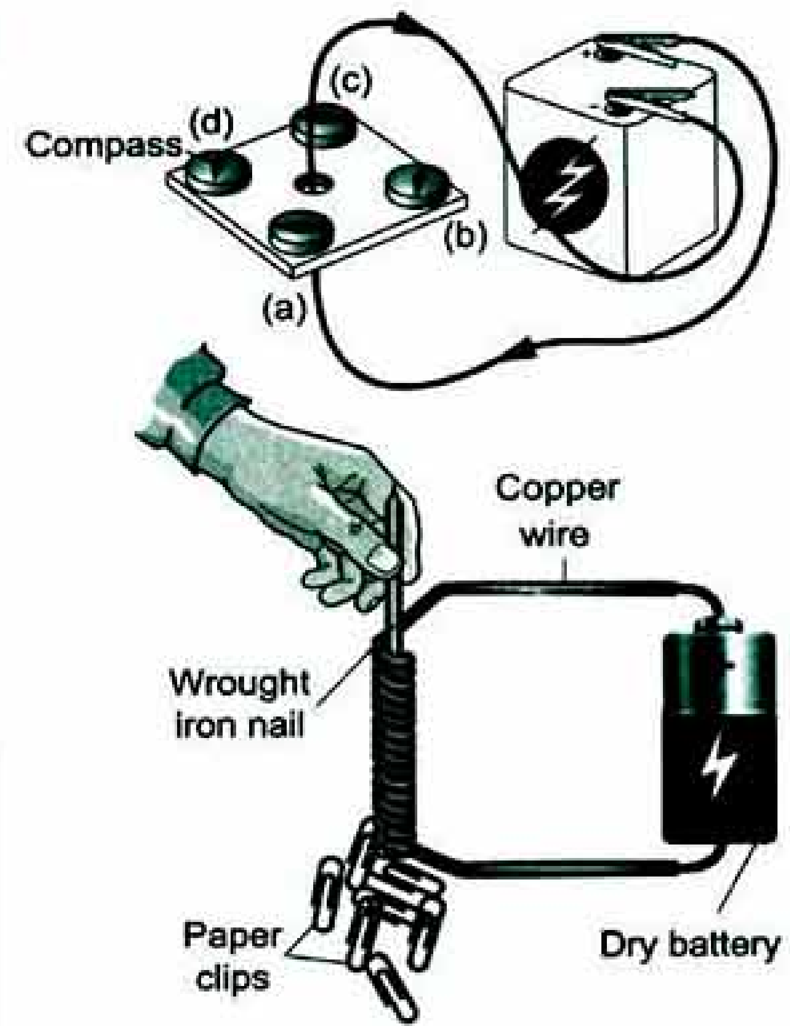
1. .... 2. .... 3. .... 4. ....

[B] Complete the table :

Points of comparison	Transparent material	Opaque material
1. Definition :	....	....
2. Examples :	....	....

2 Part

[C] What is your observation and conclusion :



1. Put the wire beside the compass.

....

....

2. When approach the iron nail to paper clips.

....

....

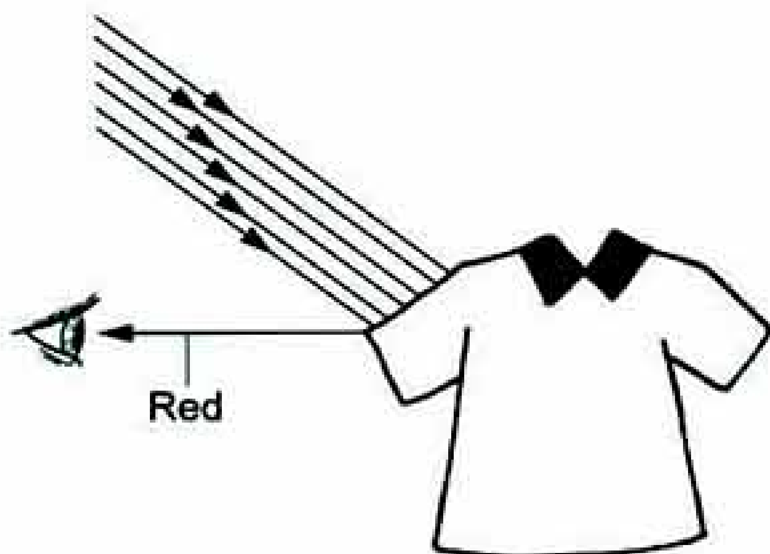
2 Cairo Governorate — Al Maadi Educational directorate, Manarat Al Maadi Language School

Answer the following questions :

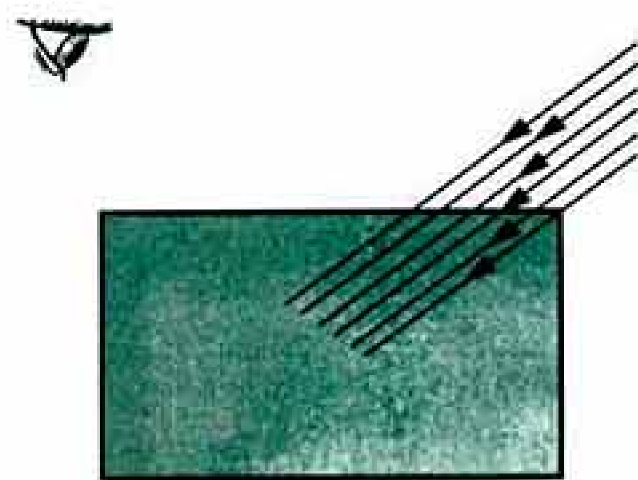
1 [A] Complete the following sentences :

1. .... and .... are ways of mixing solid materials.
2. Like magnetic poles .... and dislike magnetic poles .... each other.
3. The filaria worm causes .... disease, while fleas causes .... disease.
4. The electromagnet changes .... energy into .... energy.
5. Camouflage is found in some living organisms such as .... and ....
6. Solubility process depends on .... and ....

[B] What is the colour of the body in each case :



.... (1) ....



.... (2) ....

2 [A] Choose the correct answer :

1. All the following are secondary coloured lights except ....
   a. yellow. b. magenta. c. blue. d. cyan.
2. Salt solution is considered as .... solution.
   a. homogeneous b. heterogeneous c. suspension d. (a) and (c)
3. The devoured animal by another animal is known as the ....
   a. saprophyte. b. parasite. c. prey. d. predator.
4. The image formed through narrow holes is ....
   a. minimized. b. enlarged. c. inverted. d. (a) and (c).

[B] Give reasons for :

1. Formation of shadow.
   ....
2. Some plants are known as insectivorous plants.
   ....
3. Air is considered a mixture.
   ....
4. The spoon seems broken in a cup of water.
   ....

3 [A] Write the scientific term of each of the following statements :

1. A darkened area that is formed when light falls on an opaque object. (..............)
2. The natural area including living organisms and non-living things. (..............)
3. A device used to convert kinetic energy into electric energy. (..............)
4. A method used to separate iron objects from other solid substances in a mixture. (..............)

[B] Mention one use for each of the following :

1. Compass.
   ....
2. Separating funnel.
   ....
3. The electromagnet.
   ....
4. Glass prism.
   ....

4 [A] Put (✓) or (✗) , then correct the wrong ones :

1. Stirring increases the time of solubility.
   .... (   )

2. Image can be seen clearly behind carton.
.... ( )
3. In mutualism, each organism gets benefit from the other.
.... ( )
4. Cutting trees harms the environmental balance.
.... ( )

[B] What happens when .... ?

1. Hanging a magnet and allow it to move freely.
....
2. Mixing the seven spectrum colours.
....
3. Decomposers disappear from an environment.
....
4. Heating salty water for a long time.
....

3 Cairo Governorate

Eastern Nasr city Educational Zone
Thebes Lang. School

Answer the following questions :

1 Complete :

1. The basic idea of the dynamo is the changing of .... energy into .... energy.
2. The spectrum colours starts with .... colour and ends with .... colour.
3. .... is a common solvent.
4. The relationship between sponge and tiny aquatic living organisms is ....
5. Like magnetic poles .... each other, whereas dislike poles .... each other.

2 [A] Write the scientific term :

1. A device used to locate the main four directions. (..................)
2. A darkened area formed behind an object once light falls on it. (..................)
3. The space around the magnet in which the magnetic force appears. (..................)
4. It is any natural area including living organisms and non-living things. (..................)
5. The seven colours of light which are formed in the sky during rainfall. (..................)

[B] Give reasons for :

1. Wood is an opaque material.

....

2. Both milk and tomato sauce are mixtures.

....

3. Frogs undergo camouflage and change their colour.

....

3 [A] Choose the correct answer :

1. .... is used to separate water-oil mixture.
   a. Filtration　b. Separating funnel　c. Evaporation
2. Mixing blue light with red light produces .... light.
   a. cyan　b. yellow　c. magenta
3. Mosquito causes .... disease.
   a. small pox　b. malaria　c. elephantiasis
4. Plants which can't make their protein are called .... plants.
   a. prey　b. insectivorous　c. host
5. Light travels in .... lines.
   a. curved　b. broken　c. straight
6. By increasing the temperature of the solution, the speed of solubility ....
   a. increases.　b. decreases.　c. doesn't change.

[B] Put (✓) or (✗) in front of each of the following :

1. Fungi that feed on the dead organisms bodies are called producers. (　　)
2. The electric current has magnetic effect. (　　)
3. The image which is formed through narrow holes is inverted. (　　)
4. A mixture of salt and water can be separated by a magnet. (　　)

4 [A] Correct the underlined words :

1. An electromagnet changes electric energy into **kinetic** energy. (....................)
2. Bilharzia and ascaris worms are **external** parasites. (....................)
3. An object seems black as it **reflects** all the light colours. (....................)
4. Light reflects **regularly** when it falls on the surface of a paper. (....................)
5. Salty solution is **a heterogeneous** mixture. (....................)

[B] What happens if ... ?

1. Hanging a magnet and allow it to move freely.

....

2. White light falls on a green object.

....

[C] Compare between magnetic and non-magnetic materials :

Points of comparison	Magnetic materials	Non-magnetic materials
1. Definition :	....	....
2. Examples :	....	....

4 Cairo Governorate

East Nasr City Directorate
Manaret Heliopolis Lang. School

Answer the following questions :

1 Complete the following sentences :

1. Light travels in .... lines, and the light energy that can be seen is called the ....
2. The basic idea of the electric generator is the changing of .... energy into .... energy.
3. As the white light falls on a red apple, it absorbs .... light colours and reflects .... colour.
4. Predation is less common in .... world than in .... world.
5. In the salty solution .... is the solute and .... is the solvent.
6. Nodular bacteria benefit from bean plant by getting .... which made by the plant during .... process.
7. Bees which look like wasps undergo .... phenomenon, while chameleons undergo .... phenomenon.
8. Like magnetic poles .... each other, whereas unlike poles .... each other.

2 Write the scientific term of each of the following statements :

1. The main source of light on the Earth planet. (....................)
2. A food relationship between two organisms that benefit from each other. (....................)
3. Materials that things cannot be seen behind them. (....................)

4. The natural area including living organisms and non-living things. (....................)
5. A darkened area which is formed as a result of light falling on an opaque object. (....................)
6. The change in the direction of light rays when it passes from a transparent medium to another transparent medium. (....................)
7. A common solvent in which thousands of substances dissolve in it. (....................)
8. The process by which a solute dissolves in a solvent leading to the disappearance of the solute. (....................)

3 Choose the correct answer :

1. .... reflects all light colours fall on it.
   a. White opaque object b. Black opaque object
   c. Red opaque object d. Green opaque object
2. Atmospheric air is an example of .... mixture.
   a. gaseous-gaseous b. compound
   c. liquid d. solid-liquid
3. The solubility time is decreased by ....
   a. increasing the stirring process. b. increasing the temperature.
   c. increasing the amount of solvent. d. all the previous.
4 All the following are primary light colours except .... is secondary light colour.
   a. yellow b. green c. blue d. red
5. We can see things as a result of .... of light rays.
   a. reflection b. refraction c. decompose d. analysis
6. From insect-eaters plants is ....
   a. drosera. b. mushroom. c. bean. d. banana.
7. To separate sand from water by ....
   a. filtration. b. grinding. c. shaking. d. separating funnel.
8. Mosquitoes cause .... disease to man.
   a. malaria b. small pox c. filaria d. liver

4 [A] Give reasons for each of the following :

1. The moon seems luminous although it is a dark body.
....
2. Both sugar and distilled water are considered as pure matter.
....

2
Part

[B] Put (✓) or (✗) and correct the wrong ones :

1. A glass prism is used to separate white light into four spectrum colours. (   )
   ....
2. The magnet has three poles. (   )
   ....
3. The electromagnet is used for making electric bells and electric mixer. (   )
   ....
4. Green plants are called autotrophic organisms. (   )
   ....
5. Oil and water can be separated by a magnet. (   )
   ....
6. Bilharzia worm, tape worm and ascaris worm are external parasites. (   )
   ....

5 Cairo Governorate

New Cairo Zone
Manor House International School

Answer the following questions :

1 Complete the following :

1. .... and .... are from the factors that harm the environmental balance.
2. Parasitism may be .... or ....
3. Dynamo changes the .... energy into .... energy.
4. The solution consists of .... and ....
5. When we move a coil between two poles of a magnet .... is generated in the coil.
6. The white board............... all light colours, while the black board .... all light colours.
7. Light reflects when it falls on a ...., while it refracts when it passes from water to ....
8. The nearer object to the light source has the .... shadow.

2 [A] Write the scientific term :

1. It's the returning back of light when it falls on a smooth and shiny object. (...............)
2. The liquid used to dissolve the solid substance. (...............)

3. The materials that are not attracted to the magnet. (....................)
4. A set that is used to detect the main four directions. (....................)

[B] Mention one use for each of the following :

1. Separating funnel .

....

2. Magnet.

....

[C] What are the factors that keep the environmental balance ?

....

....

3 [A] Correct these statements :

1. The magnetic field is the ability of magnet to attract the magnetic materials .

....

2. Rainbow is formed in the sky before raining.

....

3. Mixture of sugar in water is a heterogeneous mixture.

....

4. Light transmits in curved lines.

....

[B] Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Spectrum colours	a. relationship between decomposer and dead body.
2. Magnetic field	b. like mirror.
3. Reflecting surface	c. the 7 colours which the sunlight are made up of.
4. Saprophytism	d. is a way to separate mixtures.
5. Filtration	e. it's the space around the magnet in which the magnetic force appears.

1. .... 2. .... 3. .... 4. .... 5. ....

4 [A] Give reasons for each of the following :

1. We must increase the number of coil turns and use strong magnet in dynamo.
....
2. Water is considered as a common solvent.
....
3. Foil paper is an opaque material.
....
4. We must wear white clothes in summer.
....
5. Red, green and blue are primary light colours.
....

[B] Choose the correct answer :

1. In predation, the lion is ....
   a. predator. b. prey. c. parasite.
2. When a magnet is suspended freely, it will point to ....
   a. north. b. south. c. north and south.
3. Mixing green and blue gives ....
   a. magneta. b. yellow. c. cyan.

6 Cairo Governorate

El Zietoun Educational Administration
Gomhouria Language School

Answer the following questions :

1 [A] Complete the following sentences :

1. The image formed through narrow holes is .... and ....
2. Like magnetic poles ...., whereas unlike poles .... each other.
3. .... and .... are from saprophytic organisms.
4. The scientific idea of dynamo depends on the conversion of the .... energy into .... energy.

[B] Give one use for each of the following :

1. Compass.
....
2. The electromagnet.
....
3. Glass prism.
....
4. Separating funnel.
....

2 **[A] Write the scientific term of each of the following statements :**

1. The materials which you can see objects clearly behind them. (............)
2. A natural area including living organisms and non-living things. (............)
3. The space around the magnet in which its magnetic properties appear. (............)
4. It consists of a solute and a solvent. (............)

[B] What happens if ... ?

1. Heating salty water for a long time.
....
2. Light falls on a shiny surface.
....
3. Using strong magnet in the dynamo.
....
4. Saprophytes (decomposers) disappear from the Earth.
....

3 **[A] Give reasons for each of the following :**

1. Water is called a common solvent.
....
2. The spoon seems broken in a cup of water.
....
3. Drosera and dionaea are known as insectivorous plants.
....
4. The electromagnet is considered as a temporary magnet.
....

[B] Show how you can separate the following mixtures :

1. Sugar solution.
....
2. Sand solution.
....

[C] What is meant by each of the following ... ?

1. Secondary coloured lights.
....
2. Pure substance.
....

2 Part

4 **[A] Choose the correct answer :**

1. Mixing red, green, and blue lights gives .... light.
   a. magenta b. cyan c. white
2. Temperature .... the solubility time.
   a. decreases b. increases c. doesn't affect
3. Green plants are considered as .... organisms.
   a. decomposer b. producer c. consumer
4. When the magnet hanged freely, it will take .... direction.
   a. north-west b. north-east
   c. north-south d. east-south
5. Filaria worm causes .... disease.
   a. malaria b. elephantiasis c. small pox

[B] Correct the underlined words in each of the following statements :

1. The red apple seems red, because it **absorbs** the red colour. (...............)
2. Vegetable salad and milk are **pure substances**. (...............)
3. Dissolving carbon dioxide gas in a sugar solution forms **mineral water**. (...............)

7 Giza Governorate

Haram Educational Zone
Sakkara Language School

Answer the following questions :

1 **Complete using the following words :**

(refracts - poles - grinding - electric - shaking - mechanical - transparent - saprophytic)

1. The magnetic force is most powerful at the two .... of the magnet.
2. The light .... when it transfers from a transparent medium to another.
3. The dynamo is used to convert the .... energy into .... energy.
4. .... and .... are ways of mixing solid materials.
5. Fungi are considered as .... living organisms.
6. The materials that objects can be seen through them are called .... materials.

2 **Choose the correct answer :**

1. The process of photosynthesis is made by .... organisms.
   a. producer b. consumer c. decomposer
2. When a magnet is hanged freely its north pole refers to the .... direction.
   a. east b. north c. south

3. Predation acts to .... the number of preys.
a. organize b. increase c. decrease
4. Natural magnet is one of the .... ores.
a. iron b. wood c. copper
5. The substance which dissolves in the solvent is called ....
a. solution. b. mixture. c. solute.
6. .... takes place by living organisms to hide from their enemies.
a. Commensalism b. Parasitism c. Camouflage
7. Which of the following is considered as a secondary light colour ? ....
a. Yellow. b. Green. c. Blue.
8. .... is a magnetic material.
a. Iron b. Aluminium c. Copper

3 Put (✓) or (✗) :

1. Fungi are feeding on dead organisms' bodies are called saprophytes. ( )
2. Solubility speed decreases by shaking and rising the temperature. ( )
3. The carton paper is an opaque material. ( )
4. The magnet has three poles. ( )
5. Predation is a temporary relationship between predator and prey. ( )
6. The green table reflects all light colours. ( )
7. The main source of light on the Earth's surface is electric bulb. ( )
8. The unlike magnetic poles repel and the like poles attract. ( )

4 [A] Write the scientific term of each of the following statements :

1. The energy that we can see. (..................)
2. The material in which the solute disappears in it. (..................)
3. An area around the magnet in which its magnetic force appears. (..................)
4. Food relationship between organisms get their food by devouring other organisms. (..................)
5. The relationship between two living organisms that benefit from each other. (..................)
6. Living organisms which decompose dead organisms. (..................)

[B] Give reasons for :

1. Some materials are magnetic.
....
2. Predation is not common in plants.
....

2 Part

8 Giza Governorate
6 of October Directorate
Smart Vision School

Answer the following questions :

1 Choose the correct answer :

1. A pencil seems as it broken in a cup of water due to .... of light.
   a. refraction b. absorbtion c. reflection
2. The living organism that devours another living organism is ....
   a. host. b. predator. c. saprophyte.
3. The pure substance like ....
   a. fruit salad. b. sugar. c. apple juice.
4. White opaque object .... all light colours.
   a. absorbs b. reflects c. transmits
5. The .... changes the electric energy into magnetic energy.
   a. dynamo b. electromagnet c. compass
6. The .... is used to separate the white light into 7 spectrum colours.
   a. glass prism b. compass c. dynamo
7. Light can't be transmitted through .... materials.
   a. transparent b. translucent c. opaque
8. The mixing of red , blue and green producing .... colour.
   a. magenta b. green c. white

2 [A] Write the scientific term of each of the following statements :

1. The substance which dissolves in the solvent. (........................)
2. The relationship between cat and rat. (........................)
3. The returning back of light when it falls on a surface. (........................)
4. Materials that are attracted to the magnet. (........................)
5. Any natural area contains living organisms and non-living things. (........................)

[B] Circle the odd word :

1. Red - Magenta - Blue - Green. (........................)
2. Stirring - Filtration - Shaking - Grinding. (........................)
3. Mushroom - Fish - Penecillium - Bread mold fungus. (........................)

3 [A] Give reasons for :

1. Air is considered a mixture.

....

2. Water is a common solvent.

....

3. Predation is a temporary relationship.

....

[B] Correct the underlined words :

1. Chameleon undergoes **mimicry**. (....................)
2. Banana seems **yellow** when it is seen through blue glass sheet. (....................)
3. Shadow is formed by falling light on a **transparent** object. (....................)
4. Dynamo is fixed at the **seat** of the bicycle. (....................)
5. Sand and water can be separated by **evaporation**. (....................)

4 Complete the following :

1. .... + ... ⟶ Solution.
2. .... + ... ⟶ Cyan.
3. Predation is less common in .... world than that in .... world.
4. The .... poles attract, while the .... poles repel.

9 Giza Governorate

6 of October Directorate
Sun Gate Language School

Answer the following questions :

1 Choose the correct answer :

1. The relationship between bilharizia worm and man is ....
   a. predation. b. commensalism. c. parasitism.
2. .... formed by mixing red and green.
   a. Yellow b. Cyan c. Magenta
3. Distilled water is a ....
   a. mixture. b. pure substance. c. solution.
4. Chameleon tends to make ....
   a. mimicry. b. camouflage. c. symbiosis.
5. The .... changes kinetic energy into electric energy.
   a. electromagnet b. dynamo c. motor
6. .... opaque object reflects blue colour.
   a. Black b. White c. Blue

2 Part

7. .... organizes the number of prey's population.

a. Predation b. Saprophytism c. Mutualism

8. Magnetic material like ....

a. plastic. b. copper. c. cobalt.

2 [A] Write the scientific term of each of the following statements :

1. The returning back of light rays when it falls on a surface. (....................)
2. The balance among the components of ecosystem. (....................)
3. The colours that impossible to be produced by mixing two other colours. (....................)
4. A substance which dissolves in a solvent. (....................)
5. The ability of a magnet to attract magnetic materials in its field. (....................)

[B] Give reasons for :

1. Water is a common solvent.

....

2. Predation is less common in plant world.

....

3. North pole attracts to south pole and repel with north pole.

....

3 [A] Mention one function of :

1. Compass.

....

2. Separating funnel.

....

3. Glass prism.

....

4. Magnet.

....

[B] Complete the following sentences :

1. The components of ecosystem are .... and ....
2. .... + ... ⟶ Solution.
3. Lion is a ...., while deer is a ....
4. .... object absorbs all light colours, while .... object reflects all light colours.

4 **[A] Circle the odd word :**

1. Yellow - Green - Cyan - Magenta. (....................)
2. Wood - Plastic - Iron - Glass. (....................)
3. Fleas - ascaris worm - Tape worm - Bilharzia worm. (....................)
4. Air - Clear water - Frosted glass - Glass. (....................)

[B] Put (✓) or (✗) with correction :

1. Temperature increases the solubility speed. (   )
   ....
2. Soda water is a solid-liquid mixture. (   )
   ....
3. Mosquito causes anaemia disease. (   )
   ....
4. Light travels in straight lines. (   )

10 Giza Governorate

Omrania Zone
Moharram Islamic Language School

Answer the following questions :

1 **[A] Write the scientific term of each of the following statements :**

1. A set used to separate oil-water mixture. (....................)
2. It is the substance that consists of more than one type of particles. (....................)
3. The food relationship in which one living organism devours another one. (....................)
4. A device used to convert kinetic energy into electric energy. (....................)

[B] Give reasons for :

1. Drosera is insect-eater plant.
   ....
2. Air is transparent while rock is opaque material.
   ....

2 **[A] Put (✓) or (✗) :**

1. Red, green and blue are secondary coloured lights. (   )
2. Benzene is a common solvent. (   )
3. Green table reflects all light colours. (   )
4. Fungi which feed on dead bodies are called saprophytes. (   )

[B] Choose the correct answer :

1. All the following are methods to form mixtures except ....
   a. shaking. b. grinding. c. stirring. d. evaporation.
2. Mixing blue and green lights gives .... light.
   a. yellow b. cyan c. magenta d. red
3. The speed of light in air is .... that in water.
   a. faster than b. equal to c. half d. (a) and (c)
4. All the following are magnetic materials except ....
   a. aluminium. b. iron. c. steel. d. nickel.

3 Complete the following :

1. The ecosystem may be small as .... or large as ....
2. White light separates into .... colours which are called ....
3. We wear dark clothes in ...., while white clothes in ....
4. Distilled water is ...., while mineral water is ....

4 [A] Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Mutualism	a. takes place between man and tape worms.
2. Predation	b. takes place between nodular bacteria and bean plant.
3. Commensalism	c. takes place between cat and rat.
4. Parasitism	d. takes place between sponge and the tiny aquatic organisms.

1. .... 2. .... 3. .... 4. ....

[B] Mention the function of :

1. Compass :
....
2. The electromagnet :
....

11 Alexandria Governorate — Franciscan Sisters School Ibrahimieh

Answer the following questions :

1 [A] Complete the following sentences :

1. The scientific idea of the electromagnet depends on the conversion of the .... energy into .... energy.
2. Liquid mixtures can be formed by .... or ....
3. Some autotrophic plants have to prey insects to get their required elements for making ....
4. Matter can be divided into .... and .... due to their magnetic attraction.
5. Light .... when it transfers between two different transparent media.

[B] Give reasons for the following :

1. The box of the compass isn't made from iron.
....
2. White light can be separated.
....
3. The red apple is seen red through the red glass sheet.
....
4. A mixture of salt and water isn't separated by filtration process.
....

2 [A] Which of the following processes takes place faster than the other and why ?

1. Dissolving of a quantity of salt in 100 ml. of water
or dissolving of the same quantity of salt in 300 ml. of water.
....
....
....
2. Dissolving of sugar grains or cubes in water.
....
....
....

[B] Write the scientific term :

1. The space around the magnet in which the effect of magnetic force appears. (..............)
2. The process that needs the presence of solvent and solute. (..............)
3. Materials that objects can't be seen through them. (..............)
4. The balance among the components of the ecosystem. (..............)



2 Part

[C] Correct the underlined words :

1. Decreasing the temperature **doesn't change** solubility speed. (....................)
2. **The compass** is used in making electric bell. (....................)
3. Table salt is collected by **filtration process**. (....................)
4. **Aluminium** gets attracted to the magnet. (....................)

3 [A] What happens when ... ?

1. Passing of an electric current in a wire wrapped around a rod of soft iron.
....
2. Mixing the red light with the green light.
....
3. When a magnet is hanged freely to move.
....
4. You look at a picture through a glass sheet.
....

[B] Put (✓) or (✗) and correct the mistakes :

1. The white paper absorbs all light colours that fall on its surface. ( )
....
2. Ecosystem is composed of non-living things like water and living organisms like plants. ( )
....
3. Like magnetic poles attract, while dislike poles repel each other. ( )
....
4. Distilled water is a mixture of minerals and water. ( )
....

4 [A] Mention the difference between each of the following :

1. Predator and prey.
....
....
2. Homogeneous mixtures and heterogeneous mixtures.
....
....
3. The way of self-defence in some bees and in frogs.
....
....

4. Regular reflection and irregular reflection.

....

....

[B] Mention the kind of food relationship between each of the following :

1. Nodular bacteria and bean plant. (....................)
2. Fungi and bread. (....................)

[C] Choose the correct answer :

1. The solvent in the sugary solution is ....
   a. water. b. sugar. c. non of the following.
2. .... is used to measure the electric current intensity.
   a. Compass b. Ammeter c. Dynamo
3. Translucent materials have the same colour they ....
   a. permit. b. reflect. c. refract.
4. .... is made up of only one type of identical particles.
   a. Milk b. Mineral water c. Sugar

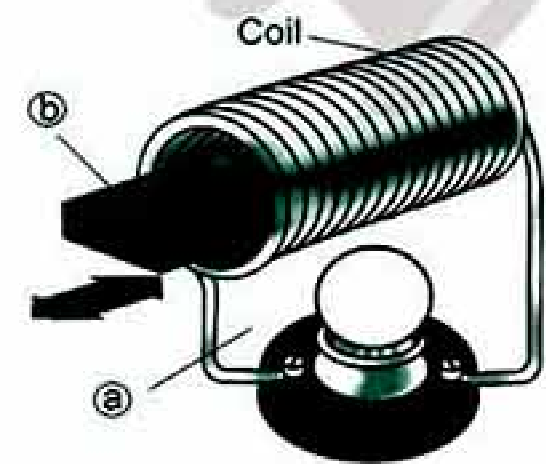
12 Alexandria Governorate — Saint Vincent De Paul School

Answer the following questions :

1 [A] Choose the correct answer :

1. All the following colours are primary lights except ....
   a. yellow. b. green. c. blue. d. red.
2. The natural magnet is one of the .... ores.
   a. copper b. aluminium c. iron d. carbon
3. All the following substances are non-magnetic except ....
   a. copper. b. aluminium. c. cobalt. d. plastic.
4. Salty solution is considered a .... mixture.
   a. homogeneous b. complex c. heterogeneous
5. The coil of the dynamo is made up of ....
   a. carbon. b. copper. c. aluminium. d. plastic.

[B] Look at the opposite figure, then answer the following :



1. The figure represents

....

2. Write the name of parts ⓐ and ⓑ.

ⓐ ....

ⓑ ....

2 Part

2 **[A] Complete the following sentences :**

1. We can separate sand from salt solution mixture by ....
2. .... + ... ⟶ Solution
3. The light .... when it transfers between two transparent media.
4. Mosquitoes infect man with .... but .... infect man with small pox.
5. The greatest .... is concentrated at the poles of the magnet.

[B] Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Cat and rat	a. solid-solid mixture.
2. Fruit salad	b. internal parasite.
3. Filaria worm	c. gas-liquid mixture.
4. Salt and water	d. predation.
5. Carbon dioxide and sugar solution	e. liquid-liquid mixture.
6. Ascaris worm.	f. elephantiasis.
	g. solid-liquid mixture.

1. .... 2. .... 3. ....
4. .... 5. .... 6. ....

[C] Cross out the odd word in each of the following :

1. Tiger - Rabbit - Lion. (.....................)
2. Salt solution - Milk - Sugar - Tomato sauce. (.....................)
3. Iron - Wood - Plastic - Aluminium. (.....................)

3 **[A] Write the scientific term :**

1. The area around the magnet in which the magnetic force appears. (.....................)
2. A darkened area formed when light falls on an opaque object. (.....................)
3. A phenomenon in which living organisms change their colour to be hidden from enemies. (.....................)
4. Plants that devour insects. (.....................)
5. A device which is used to convert the electric energy into magnetic energy. (.....................)

[B] Give reasons for :

1. We see the paper of the book white.

....

2. The glass is a non-magnetic substance.

....

3. The pencil seems to be broken in a cup of water.

....

4 [A] Put (✓) or (✗) and correct the false sentences :

1. An electric current can be generated by using a magnet. ( )

....

2. Objects are seen less clearly through transparent materials. ( )

....

3. Plants are the main sources of food on the Earth. ( )

....

4. Green table reflects all colour lights. ( )

....

5. Solubility speed decreases by shaking. ( )

....

[B] What happens when ... ?

1. White light passes through a glass prism.

....

2. Heating salty water for a long time.

....

3. You approach the north pole of a magnet to the south pole of another magnet.

....

4. There is no nodular bacteria in roots of leguminous plants as beans.

....

[C] Mention the importance for each of the following :

1. Compass.

....

2. Separating funnel.

....

2 Part

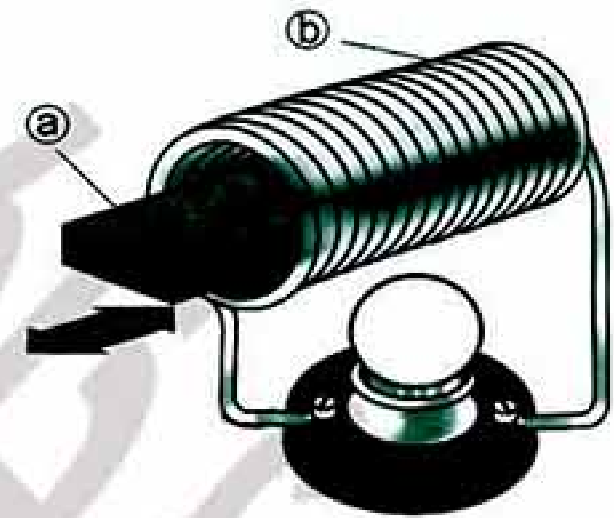
13 Alexandria Governorate — Montaza Educational Zone

Answer the following questions :

1 [A] Choose the correct answer :

1. The relationship between a cat and a rat is considered as an example of .... relationship.
   a. predation b. mutualism c. parasitism
2. If you look at a yellow banana through a green glass sheet it seems ....
   a. yellow. b. green. c. black.
3. Cyan, yellow and magenta lights are .... lights.
   a. complementary b. secondary c. primary
4. .... can change its colour to be hidden from its enemies.
   a. Frog b. Ascaris worm c. Bee
5. .... is a magnetic material.
   a. Copper b. Iron c. Paper

[B] Look at the opposite figure, then answer the following :



1. The symbol ⓐ indicates .... and the symbol ⓑ indicates ....
2. When ⓐ moves inside ⓑ .... must be generated.

2 [A] Complete the following sentences :

1. .... light is produced by mixing all spectrum colours.
2. The solution consists of .... and ....
3. Green plants are considered as .... organisms.
4. .... worms cause elephantiasis disease.

[B] Write the scientific term :

1. The natural area including living organisms and non-living things. (...............)
2. A darkened area formed behind an object once light falls on it. (...............)
3. The reflection of light on a smooth reflecting surface. (...............)

3 **[A] Put (✓) or (✗) in front of each one and then correct the wrong one :**

1. Components of the mixture lose their properties. ( )
....
2. Light refracts when it passes from air to water. ( )
....
3. Filtration is used to separate oil-water mixture. ( )
....
4. The carton is an opaque material. ( )
....

[B] Fill each space by a kind of food relationships from between brackets :

(Saprophytism - Mutualism - Commensalism)

1. Nodular bacteria and bean plant. (....................)
2. Fungi and dead organisms. (....................)
3. Sponge and tiny aquatic living organisms. (....................)

4 **[A] Give reasons for :**

1. Water is called a common solvent.
....
2. The formation of images through narrow holes.
....
3. Copper and aluminium are non-magnetic materials.
....

[B] Choose from column (B) what suits it in colamn (A) :

(A)	(B)
1. Stirring	a. the solubility time decreases.
2. Evaporation	b. to get its required elements for making protein.
3. By increasing the temperature	c. magnetite.
4. Dionaea plant preys insects	d. is used to collect table salt from salt pans.
5. Natural magnet is a black stone called	e. increases the speed of solubility.

1. .... 2. .... 3. ....
4. .... 5. ....

14 Alexandria Governorate

East Zone Directorate
Taymour English Schools

Answer the following questions :

1 [A] Complete the following sentences :

1. When light falls on a leaf, it makes .... reflection.
2. Increasing the number of coil turns increases .... of the electromagnet.
3. Water is called .... as thousands of substances can dissolve in it.
4. Banana appears yellow because it .... all light colours except .... which is ....
5. Similar magnetic poles .... while opposite poles .... each other.
6. .... can simulates the colour of the surrounding environment and it is a good example for ....

[B] Mention one function for :

1. Glass prism.

....

2. Sponge for tiny aquatic living organisms.

....

2 [A] Write the effect of the following on the solubility process :

1. Using low temperature.

....

2. Shaking.

....

3. Increasing the amount of solute.

....

[B] Correct the underlined words in each of the following statements :

1. Refraction of light depends on the **type** of light. (..................)
2. Blue, green and **yellow** are primary coloured lights. (..................)
3. Insectivorous plants need **fats** and carbohydrates. (..................)
4. The dynamo changes **heat** energy into electric energy. (..................)

3 [A] Give reasons for :

1. We cannot distinguish between particles of vinegar and water.

....

2. Compass is used inside planes.

....

[B] Write the scientific term :

1. Any natural area including living organisms and non-living things. (..........................)
2. The materials that are not attracted to the magnet. (..........................)
3. The separation method of a mixture of salt and water. (..........................)
4. The food relationship between tiger and deer. (..........................)
5. It is a darkened area which is formed when light falls on an opaque object. (..........................)

4 [A] What happens when ... ?

1. Man is infected with ascaris worm.

....

2. You put some iron filings near the center of a magnet and some near to the ends.

....

[B] Choose the correct answer :

1. Light that can be seen is called ....
   a. visible spectrum.
   b. infrared.
   c. ultraviolet
   d. all the previous.
2. .... is a semi-transparent material.
   a. Glass
   b. Water
   c. Tissue paper
   d. Mirror
3. The food relationship between beans and nodular bacteria is ....
   a. commensalism.
   b. parasitism.
   c. mutualism.
   d. saprophytism.

15 Qaliubya Governorate

Obour Educational Directorate
Resala Language School

Answer the following questions :

1 [A] Complete the following sentences :

1. The dynamo (electric generator) changes .... energy into .... energy.

2 Part

2. On mixing all the primary light colours (red + blue + green), the .... colour light is produced.
3. In sugary solution, sugar is the .... , while .... is the solvent.
4. .... , ... and grinding are the ways of mixture formation.
5. The relationship between a cat and a rat is an example of ....
6. Like magnetic poles .... , while dislike poles .... each other.
7. The spectrum colours starts with .... and ends with ....
8. There are two types of light reflection .... and ....

[B] What happens when ... ?

1. You approach the north pole of a magnet to the south pole of another magnet.

....

2. Predators disappear from an environment including few rabbits.

....

2 [A] Write the scientific term of each of the following statements :

1. A natural area contains living organisms and non-living things. (...............)
2. The space around the magnet in which the magnetic force appears. (...............)
3. A darkened area which is formed as a result of light falling on an opaque body. (...............)
4. A food relationship in which saprophytes get their food by decomposing food remains or dead organisms bodies. (...............)
5. A substance that consists of more than one type of particles. (...............)
6. The substance that disappears in the solvent. (...............)

[B] Give reasons for each of the following :

1 Iron and cobalt are magnetic materials.

....

2. Water is considered as a common solvent.

....

3 [A] Choose the correct answer :

1. .... is the main source of light.
   a. Lightened candle   b. The Sun   c. The moon   d. Torch
2. .... is attracted to the magnet.
   a. Wood   b. Chalk   c. Iron   d. (b) and (c)

3. Predation acts to .... the number of preys.
   a. organize b. increase
   c. decrease d. no correct answer
4. The natural magnet is one of the .... ores.
   a. iron b. steel c. carbon d. cobalt
5. The electromagnet changes .... energy into magnetic energy.
   a. thermal b. sound c. light d. electric
6. .... occurs by some living organisms to hide from enemies.
   a. Commensalism b. Parasitism
   c. Camouflage d. No correct answer

[B] Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Rock	a. can be separated by separating funnel.
2. Cyan	b. causes elephantiasis.
3. Filaria worm	c. is an opaque material.
4. Oil and water mixture	d. consists of blue and green lights.

1. .... 2. .... 3. .... 4. ....

4 [A] Put (✓) or (✗) :

1. A mixture of sand and water can be separated by filtration process. ( )
2. The magnet has four poles. ( )
3. Stirring increases solubility time and decreases the speed of solubility process. ( )
4. Ecosystem may be very large like universe. ( )
5. Insect-eaters plants are plants that prey small insects to make carbohydrates. ( )
6. Spiders use their woven nets for catching insects. ( )

[B] Classify the following into predator, parasite or decomposer :

(Lion - Mushroom - Mosquito - Shark - Bread mold fungus - Lice)

1. Predator :

....

2. Parasite :

....

3. Decomposer :

....

16 El-Sharkia Governorate — Science Inspectorate

Answer the following questions :

1 Complete the following sentences :

1. Like magnetic poles .... and unlike poles .... each other.
2. Red, ... and .... are primary coloured lights.
3. .... is a non-magnetic material.
4. Sepia ejects a .... fluid in the surrounding water when attacked by enemies.
5. The electromagnet changes the .... energy into .... energy.

2 [A] Write the scientific term of each of the following statements :

1. Any natural area including living organisms and non-living things. (....................)
2. Darkened area that formed as a result of falling light on an opaque object. (....................)
3. The space around the magnet in which the effect of magnetic force appears. (....................)
4. Materials that allow most light to pass through them. (....................)
5. A device that used to locate the four main geographical directions. (....................)
6. It consists of solute and solvent. (....................)

[B] Give reasons for each of the following :

1. Cobalt is a magnetic material.

....

2. Water is considered as a common solvent.

....

3 [A] Choose the correct answer :

1. An apple appears .... when you look at it through a blue transparent glass sheet.
   a. red b. black c. yellow

2. .... is used to separate a mixture of sand and water.
   a. Evaporation b. Filtration c. Separating funnel
3. .... takes place by some living organisms to hide from their enemies.
   a. Commensalism b. Parasitism c. Camouflage
4. .... are examples of decomposers.
   a. Fungi b. Rabbits c. Plants
5. Dynamo produces .... energy.
   a. electric b. light c. heat

[B] Put (✓) or (✗) :

1. Bilharzia worm is an external parasite. ( )
2. The carton is an opaque material. ( )
3. Salt and water are mixed by stirring. ( )

4 [A] Correct the underlined words :

1. The food relationship between cat and rat is a **saprophytism**. (...............)
2. Red light + Green light = **Cyan** light. (...............)
3. Vegetable salad and milk are **pure substances**. (...............)
4. Light travels in **curved** lines. (...............)

[B] What happens if ... ?

1. You mix seven spectrum colours together.
....
2. White light falls on a black opaque object.
....

[C] Define the following :

1. Environmental balance.
....
2. Visible spectrum.
....

17 El- Menofia Governorate Shebeen El-Koum Directorate

Answer the following questions :

1 Complete the following sentences :

1. We can see .... in the sky during the rain falling.

2 Part

2. The basic idea of the electric generator is the changing of the .... energy into .... energy.
3. The image which is formed by the narrow holes is .... and ....
4. .... is used to separate a mixture of sand and iron filings.
5. .... and .... are from the ways of self-defence against predation in living organisms.

2 [A] Write the scientific term of each of the following statements :

1. The materials that are attracted to the magnet. (...............)
2. It contains of more than one type of particles. (...............)
3. The devoured animal in the predation relationship. (...............)
4. The process of formation a solution. (...............)
5. The natural area including living organisms and non-living things. (...............)
6. A space around the magnet in which the magnetic force appears. (...............)

[B] What happens when ... ?

1. You look at a red apple through a green glass sheet.

....

2. You place your hand between a light source and the wall.

....

3 [A] Choose the correct answer :

1. Mixing red and green lights produces .... light.
   a. yellow b. cyan c. magenta
2. The solute in the mixture of chocolate and milk is ....
   a. water. b. milk. c. chocolate.
3. The speed of light in air is .... that in water.
   a. faster than b. slower than c. equal to
4. When the compass is put beside a wire carrying an electric current ....
   a. no deflection occurs. b. the needle deflects. c. no correct answer.

[B] Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Dinosaur	a. decompose food remains.
2. Fungi	b. get shelter and food from sponge.
3. Tap worms	c. is an example of extinct animals.
4. Tiny aquatic living organisms	d. share the host its digested food.

1. .... 2. .... 3. .... 4. ....

4 [A] Give reasons for each of the following :

1. Wood is an opaque material.

....

2. The compass is an important tool for travellers.

....

[B] Correct the underlined words in each of the following statements :

1. Some types of **mosquitoes** infect man with small pox disease. (....................)
2. Solubility speed **decreases** by rising the temperature. (....................)
3. The unlike magnetic poles **repel** each other. (....................)
4. Nodular bacteria fix **oxygen** in an inorganic form. (....................)
5. White objects **absorb** all the lights that fall on them. (....................)

18 El-Gharbia Governorate — Central Science Supervision

Answer the following questions :

1 [A] Complete the following sentences :

1. The magnetic force is most powerful at the .... of the magnet and disappears at its ....
2. The ecosystem consists of two main components which are .... and ....
3. Mixing a small amount of mud with water forming .... solution that can be separated by ....
4. Light never transmits through .... materials and .... is formed as a result of the falling of light on these materials.
5. On mixing all spectrum colours, the .... light is produced that can be separated again by using ....

2 Part

[B] Write the name and the type of the living organism which causes the following :

	The living organism	Its type
1. Elephantiasis :	....	....
2. Small pox :	....	....
3. Rotten of bread :	....	....

2 [A] Choose the correct answer in each of the following :

1. .... is a magnetic material.
   a. Copper b. Iron c. Aluminium d. (a) and (c)
2. The dynamo is fixed in the bicycle ....
   a. seat. b. pedal. c. tire. d. lamp.
3. Yellow, cyan and magenta light colours are named as .... light colours.
   a. secondary b. purple c. primary d. rainbow
4. Salt and pepper can be mixed by ....
   a. shaking. b. grinding. c. stirring. d. (a) and (b).

[B] Give reasons for each of the following :

1. Predation is a temporary food relationship.
   ....
2. Increasing the number of coil turns of the electromagnet.
   ....

[C] Give an example for each of the following :

1. An insectivorous plant : ....
2. A living organism undergoes mimicry : ....
3. A gaseous-gaseous mixture : ....
4. A common solvent : ....

3 [A] Write the scientific term for each of the following statements :

1. A phenomenon appears in the sky when sunlight passes through water droplets during rain falling. (....................)
2. The food relationship between tiny aquatic organisms and sponge. (....................)

3. The process by which a solute dissolves in a solvent leading to the disappearance of the solute. (....................)
4. The space around the magnet in which the effect of magnetic force appears. (....................)

[B] Mention only one use (importance) for each of the following :

1. Evaporation process : ....
2. The electromagnet : ....
3. Compass : ....
4. Ammeter : ....

4 [A] Correct the underlined word in each of the following :

1. The image formed through a narrow hole is **upright magnified**. (....................)
2. If the available food resources become insufficient, **friendship** appears among preys' population. (....................)
3. The white dress appears **green** when red light strikes it. (....................)
4. **Predators** recycle the chemical elements within the ecosystem. (....................)

[B] What happens when ... ?

1. The light passes between two different transparent media.
....
2. Grinding of sugar before dissolving it in a liquid.
....
3. A cuttlefish is attacked by an enemy.
....

[C] Give one difference between regular reflection and irregular reflection of light.

....
....
....

19 El-Dakahlia Governorate — Educational Directorate

Answer the following questions :

1 [A] Choose the correct answer :

1. Most mixtures formed by dissolving in liquids are .... mixtures.
   a. identical b. homogeneous c. heterogeneous

2 Part

2. Bacteria is ....
   a. producer. b. decomposer. c. parasite.
3. Plants get energy from ....
   a. sunlight. b. oxygen. c. chlorophyll.
4. The dynamo generates .... energy from mechanical energy.
   a. thermal b. light c. electric

[B] Give reasons for each of the following :

1. Opaque objects form shadows.
   ....
2. The compass used to identify the four geographical directions.
   ....
3. The banana fruit seems to be yellow.
   ....
4. Water is called a common solvent.
   ....

2 [A] Put (✓) or (✗) and correct the worng ones :

1. Yellow, purple and blue lights are primary light colours. ( )
   ....
2. The coil of the dynamo is made up of copper wire. ( )
   ....
3. A separating funnel is used to separate heterogeneous mixtures. ( )
   ....
4. The ecosystem may be large like a pond or small like a desert. ( )
   ....

[B] Write the scientific term for each of the following :

1. The light energy that can be seen. (...............)
2. A food relationship between two living organisms that benefit from each other. (...............)
3. A chemical substance that doesn't dissolve in a water. (...............)
4. Reflection of light on the surface of a white paper in different directions. (...............)

3 [A] Complete the following sentences :

1. The magnetic force is most powerful at the .... of the magnet.
2. We use the .... to separate the white light into its seven colours.

3. The factories use huge .... to move the heavy iron blocks.
4. Changing the nautral circumstances of the environment in ancient eras leads to dinosaurs ....

[B] What is the difference between each pair of the following :

1. Magnetic and non-magnetic materials.
....
....
2. Pure substance and mixture.
....
....
3. Transparent and opaque material.
....
....

4 [A] What do you expect to happen in the following cases :

1. Man continues cutting forest trees.
....
2. Holding a magnet freely.
....

[B] Why the pencil inside a glass of water seems broken ?

....

[C] Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Plastic 2. Steel 3. Compass 4. The south pole 5. Magnetic field	a. is the pole which always refers to the south direction of the Earth. b. is a magnetic material. c. is the area surrounding the magnet, where the magnetic force appears. d. is a non-magnetic material. e. is a device used to identify the main four geographical directions.

1. .... 2. .... 3. .... 4. .... 5. ....

2 Part

20 Ismailia Governorate — Directorate of Education

Answer the following questions :

1 [A] Complete the following sentences :

1. Sea water is ...., while sugar is ....
2. In the dynamo the .... energy changes into .... energy.
3. The image formed through narrow holes is .... and ....
4. The like magnetic poles .... each other, while the dislike magnetic poles .... each other.
5. Mixture can be formed by shaking, ... and ....

[B] What happens when ... ?

1. Man interference by polluting the environment.

....

2. Cutting the electric current from the electromagnet.

....

3. You look at a yellow banana through a blue glass sheet.

....

2 [A] Write the scientific term :

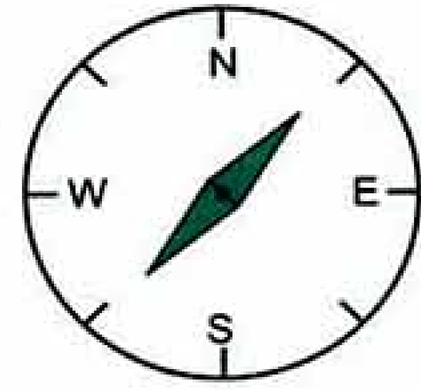
1. Natural area including living organisms and non-living things. (.....................)
2. The light energy that can be seen. (.....................)
3. An area of the magnet, where magnetic force is most powerful. (.....................)
4. The materials through which light can't transmit. (.....................)

[B] Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Fleas	a. causes elephantiasis.
2. Filaria worm	b. causes malaria.
3. A mosquito	c. causes bread mold.
4. Ascaris worm	d. causes anaemia.
	e. cause small pox.

1. .... 2. .... 3. .... 4. ....

3 **[A] Look at the opposite figure, then answer the following :**



1. The opposite apparatus is known as ....
2. We use it to know ....
3. It contains ....

[B] Give reasons for :

1. Water is a common solvent.
....
2. The death of the host is considered a loss to the parasite.
....
3. The formation of a shadow.
....

[C] Mention one use :

1. Separating funnel :
....
2. Glass prism :
....

---

4 **[A] Choose the correct answer :**

1. Mixing .... lights produces yellow light.
   a. red + blue b. green + blue c. red + cyan d. red + green
2. You can separate sand from sand-water mixture by ....
   a. filtration. b. evaporation. c. magnet. d. all the previous.
3. .... is a magnetic material.
   a. Copper b. Aluminium c. Glass d. Iron
4. As .... decreases, the solubility speed increases.
   a. the amount of solvent b. stirring
   c. temperature d. the amount of solute
5. The huge electromagnet is used in ....
   a. electric bell. b. cranes. c. telephone. d. car toy.

[B] Mention the kind of food relationship between the following :

1. Nodular bacteria and bean plant. (..............)
2. Drosera and insects. (..............)
3. Wet bread and bread mold fungus . (..............)

2
Part

21 Suez Governorate — Directorate of Education

Answer the following questions :

1 [A] Complete the following sentences :

1. The material which doesn't allow light to transmit through is called ....
2. A set that changes the mechanical energy into electric energy known as ....
3. Red light + Green light + Blue light = ...
4. The magnetic pole that always refers to the north direction is called ....
5. Increasing temperature .... solubility time.
6. .... is from the extinct organisms due to the change in the natural conditions.

[B] Mention the name of the tool that can be used in each case :

1. Separating a mixture of oil and water.
....
2. Separating of white light into seven colours.
....

2 [A] Write the scientific term :

1. The organisms which help in getting rid of dead organisms. (...............)
2. The colour lights we get by mixing two colours of the primary coloured lights. (...............)
3. A tool that is used for locating the main four geographical directions. (...............)
4. A process needs the presence of solvent and solute. (...............)
5. The food relationship between two organisms that get benefit from each other. (...............)
6. The natural area including living organisms and non-living things. (...............)

[B] Compare between each of the following :

Points of comparison	Magnetic materials	Non-magnetic materials
Definition :	....	....
Examples :	....	....

3 **[A] Choose the correct answer :**

1. The dynamo is fixed in the bicycle ....
   a. seat. b. pedal. c. tire.
2. The picture formed through a narrow hole is ....
   a. upright minimized. b. inverted minimized. c. inverted magnified.
3. Which of the following is considered as a secondary colour ? ....
   a. Yellow. b. Green. c. Blue.
4. We can see things as a result of .... of light rays.
   a. reflection b. refraction c. absorption
5. The animal that devours another animal is called ....
   a. parasite. b. host. c. predator.
6. An example of decomposers is ....
   a. fungus. b. rabbit. c. plant.

[B] What happens in each of the following ... ?

1. When a magnet is hanged to move freely.
   ....
2. Cutting down of trees.
   ....

---

4 **[A] Put (✓) or (✗) :**

1. Filtration is used to separate soluble solid materials. ( )
2. Some living organisms can change their colour to simulate the colours of their surrounding environment where they live to hide from their enemies. ( )
3. The balance of ecosystem occurs due to the interference of man. ( )

[B] Give reasons for :

1. The moon cannot be considered as a source of light.
   ....
2. Air is considered a mixture.
   ....

[C] Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Ascaris worm	a. can be separated by using a magnet.
2. Pure water	b. internally parasitism.
3. Iron filings and sand mixture	c. causes anaemia.
4. A food relationship between man and liver worm	d. pure substance.
	e. externally parasitism.

1. .... 2. .... 3. .... 4. ....

2 Part

22 Port Said Governorate — Port Said Educational Board

Answer the following questions :

1 Complete the following sentences :

1. Mixtures can be formed by shaking, ... or ....
2. Transparent and translucent objects have the colour of the light which .... , but opaque objects have the colour of light they ....
3. Ecosystem is a natural area that contains .... and ....
4. Like magnetic poles .... , while unlike poles .... each other.

2 [A] Choose the correct answer :

1. Living organisms use .... to escape from their enemies.
   a. predation b. saprophytism c. mimicry d. symbiosis
2. The natural magnet is one of the .... ores.
   a. copper b. iron c. carbon d. aluminium
3. Bilharzia worms are considered as .... organisms.
   a. producer b. consumer c. decomposer d. parasitic
4. .... is one of the primary colours.
   a. Green b. Magenta c. Yellow d. Cyan

[B] Give reasons for :

Shadow is formed for opaque objects.

....

3 [A] Write the scientific term :

1. A food relationship between two different types of living organisms in which they benefit from each other. (........................)
2. The space around a magnet in which the magnetic force appears through. (........................)
3. Extinct organism as a result of changing the natural circumstances of the environment. (........................)
4. The bouncing of light when it falls on a bright surface. (........................)

[B] What happens when ... ?

Passing white light through a glass prism.

....

4 [A] Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Filaria worm	a. is used to move iron blocks.
2. Solvent	b. conveys small pox to man.
3. Electromagnet	c. causes elephantiasis to man.
4. Wood	d. is the substance in which the solute dissolves.
5. Bread mould fungus	e. is a saprophytic organism.
	f. is a non-magnetic material.

1. .... 2. .... 3. ....
4. .... 5. ....

[B] In the opposite figure :

The tool used in separating this mixture is .... , and it is used in separating ....



23 Damietta Governorate — Directorate of Education

Answer the following questions :

1 [A] Complete the following statements :

1. The ecosystem is a natural area that contains .... and ....
2. The solution is a mixture of .... and ....
3. The relationship between sponge and the tiny aquatic living organisms is ...., while the relationship between nodular bacteria and leguminous plants is ....
4. In the electromagnet, the .... energy changes into .... energy.
5. Solid materials can be mixed by .... or ....

[B] Correct the underlined words in each of the following statements :

1. Fungi that feed on the dead organisms are called **parasites**. (....................)
2. When a red light strikes a white object, the object appears **cyan**. (....................)
3. Natural magnet is a **red** rock. (....................)

2
Part

2 [A] Write the scientific term for each of the following :

1. A device that used to locate the four main geographical directions. (....................)
2. A device that used to change the mechanical energy into electric energy. (....................)
3. The space around the magnet in which the effect of magnetic force appears. (....................)
4. A phenomenon in which the harmless organisms imitate other harmful or poisonous organisms to frighten their enemies and escape from them. (....................)
5. Materials that are not attracted to the magnet. (....................)

[B] Give reasons for :

1. The pen appears broken in a glass of water.
....
2. Air is considered a mxiture.
....
3. Drosera and dionaea are known as insectivorous plants.
....

3 Choose the correct answer :

1. The salt solution is .... mixture.
   a. a homogeneous b. a heterogeneous c. solid d. gas
2. Ascaris worm is a ....
   a. decomposer. b. producer. c. parasite. d. predator.
3. The solubility speed increases when .... decreases.
   a. temperature b. stirring
   c. the amount of solvent d. the amount of solute
4. From the magnetic materials is ....
   a. aluminium. b. iron. c. copper. d. wood.
5. Which of the following is considered as a secondary colour ? ....
   a. Yellow. b. Green. c. Blue. d. Red.
6. Light travels in .... lines.
   a. curved b. broken c. straight d. zigzag
7. Filaria worm causes .... disease to man.
   a. malaria b. small pox c. bilharzia d. elephantiasis

8. We can see objects as a result of .... of light rays.
   a. refraction b. reflection
   c. analysis d. absorption

4 [A] What is meant by each of the following ... ?

1. Environmental balance.
....
2. Semi-transparent materials.
....

[B] What happens if ... ?

1. A chameleon feels danger.
....
2. You approach a north pole of a magnet to a south pole of another magnet.
....
3. Mixing the seven spectrum colours.
....

[C] How can you separate the following mixtures ?

1. A mixture of salt in water.
....
2. A mixture of sand and water.
....
3. A mixture of iron nails and sand.
....

24 Kafr El-Sheikh Governorate — Directorate of Education

Answer the following questions :

1 Complete the following sentences :

1. Red, green and blue coloured lights are called ....
2. Like magnetic poles ...., while unlike poles .... each other.
3. On mixing all the seven spectrum colours, the .... is produced.
4. A mixture can be formed by stirring, ... or ....
5. .... + ... $\xrightarrow{\text{Solubility process}}$ Solution.

2 Choose the correct answer :

1. Green plants are considered as ....
   a. producers. b. parasites. c. decomposers.

2
Part

2. Mosquitoes cause .... disease to man.
 a. elephantiasis b. malaria c. bilharziasis
3. A salty solution is considered a/an .... mixture.
 a. homogeneous b. heterogeneous c. identical
4. We can see things as a result of .... of light rays.
 a. refraction b. reflection c. absorption
5. .... can change its colour to stimulate the colours of the surrounding environment.
 a. Bee b. Chameleon c. Ascaris worm
6. The coil of a dynamo is made of .... wire.
 a. copper b. graphite c. iron
7. .... is used to separate a mixture of oil and water.
 a. Magnetic attraction b. Evaporation c. Separating funnel
8. The animal that devours another animal is called a ....
 a. prey. b. host. c. predator.

3 **[A] Write the scientific term :**

1. The change of light rays directions when they transmit through the separating surface between two different transparent media . (........................)
2. The darkened area formed as a result of the falling of light on an opaque object. (........................)
3. The space around the magnet in which the magnetic force appears. (........................)
4. Materials which you can see objects clearly behind them. (........................)
5. A tool that is used for locating the four main geographical directions. (........................)
6. The relationship between two organisms that benefit from each other. (........................)

[B] Give reasons for :

1. Water is considered as a common solvent.
 ....
2. Images can be formed by using narrow holes.
 ....

4 **[A] Put (✓) or (✗) :**

1. There is no relationship between living organisms. ( )
2. Carton paper is an opaque object. ( )
3. Filtration and magnetic attraction are ways for mixture formation. ( )

4. Magnetism is concentrated in the middle of the magnet. ( )
5. The moon seems luminous because it reflects sunlight. ( )
6. A natural magnet is one of the iron ores. ( )

[B] How can the following mixtures be separated ?

1. Sand and water.

....

2. Iron nails in sand.

....

25 El-Behira Governorate — El-Safwa Private Schools

Answer the following questions :

1 Complete the following sentences :

1. Opaque objects .... passing of light, while transparent objects .... passing of light.
2. .... is from internal parasites, while .... is from external parasites.
3. .... and .... are from methods of mixture formation.
4. Predation process .... the number of preys.
5. .... is pure substance.

2 [A] Choose the correct answer :

1. In dynamo, kinetic energy changes to .... energy.
   a. electric b. light c. magnetic d. sound
2. All the following are from transparent materials except ....
   a. carton b. glass. c. water. d. air.
3. By mixing all spectrum colours .... colour is produced.
   a. magenta b. black c. white d. blue
4. Spoon seems broken in a cup containing water due to ....
   a. light reflection. b. light splitting.
   c. light refraction. d. light travels in straight line.

[B] Compare between :

P.O.C	Magnetic materials	Non-magnetic materials
Definition :	....	....
Examples :	....	....

2 Part

3 **[A] Write the scientific term :**

1. Returning back of light rays when they fall on a plane mirror. (....................)
2. The space around a the magnet and the magnetic force appears on it. (....................)
3. The substance that dissolves in the solvent. (....................)
4. It is natural area including living organisms and non-living things. (....................)

[B] Give reasons for :

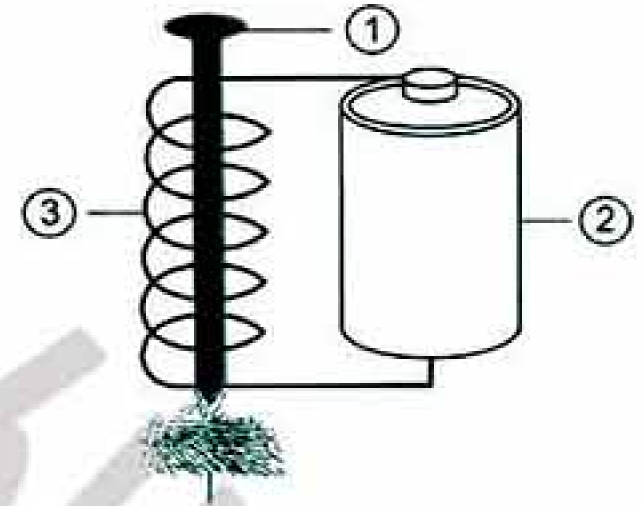
1. Red apple appears black through blue glass sheet.

....

2. Some living organisms can make mimicry or camouflage.

....

4 **[A] Look at the opposite figure then answer the following :**



1. The figure represents ......

① Points to ....
② Points to ....
③ Points to ....

2. What happens if ... ?

You near some iron filings to the figure.

....

[B] Write the name of tools which used in :

1. Knowing the four directions. (....................)
2. Separation of a mixture of oil and water. (....................)

26 Fayoum Governorate — Salaam Language School

Answer the following questions :

1 **Complete the following sentences :**

1. The idea of working of the electromagnet is the change of .... energy into .... energy.
2. In salty solution salt is the .... , while water is the ....
3. Plants that feed on some insects are known as .... plants such as ....
4. Like magnetic poles .... whereas dislike poles .... each other.

2 **[A] Write the scientific term :**

1. The regions of the magnet where the magnetic force is most powerful. (....................)
2. A darkened area that formed when light falls on an opaque object. (....................)
3. The natural area including living organisms and non-living things. (....................)
4. Substances that are made up of only one type of identical particles. (....................)
5. The light energy that can be seen. (....................)

[B] Mention the function of each of the following :

1. Glass prism.

....

2. Filter paper.

....

3 **[A] Choose the correct answer :**

1. When the magnet is hanged freely it will take the direction ....
   a. north and east. b. north and south. c. west and east
2. The properties of the image which formed through narrow holes are ....
   a. small and inverted. b. small and upright. c. large and inverted.
3. .... ejects a black colour fluid in the surrounding water when attacked by its enemies.
   a. Frog b. Butterfly c. Sepia
4. When you mix two or more kinds of matter together, the produced matter is called ....
   a. element. b. compound. c. mixture.

[B] What happens in each case of the following ... ?

1. Approaching a magnet to a mixture of sand and iron nails.

....

2. When you look at a spoon put in a beaker contains water.

....

4 **[A] Correct the underlined words :**

1. Mosquitoes infect man with **elephantiasis**. (....................)

2. **Newton** is the scientist who discovered that the magnetic energy can be changed into electric energy. (....................)
3. The solubility speed of solids **decreases** by grinding. (....................)
4. In the **regular** reflection, the light rays are reflected in different directions. (....................)

[B] Give reasons for each of the following :

1. Aluminium, copper and glass are non-magnetic materials.
....
2. Air is considered a mixture.
....

27 Beni-Sueif Governorate — Governmental Language Schools

Answer the following questions :

1 [A] Complete the following statements :

1. The similar magnetic poles .... and the opposite poles .... each other.
2. Dynamo converts .... energy into .... energy.
3. The ecosystem consists of .... and ....
4. .... is a common solvent.

[B] Give reasons for each of the following :

1. Sugar is a pure substance.
....
2. A pencil seems broken when it is placed in a glass cup of water.
....

2 Write the scientific term :

1. A set is used to change electric energy into magnetic energy. (....................)
2. It is the bouncing (returning back) of light rays. (....................)
3. It is the balance among the components of the ecosystem. (....................)
4. A food relationship between lion and deer. (....................)

3 Choose the correct answer :

1. Light transmits in .... lines.
   a. broken b. curved c. straight

2. We can distinguish between the components of ....
   a. homogeneous mixture. b. solution. c. heterogeneous mixture.
3. Wood is a an .... material.
   a. transparent b. opaque c. semi-transparent
4. .... is considered as a mixture.
   a. Milk b. Baking soda c. Distilled water

4 [A] Correct the underlined words :

1. **Opaque** material allows most light to pass through it. (....................)
2. Cyan, yellow and magenta are **primary** coloured lights. (....................)
3. Fleas cause **anaemia** to human. (....................)
4. Copper and **iron** are non-magnetic materials. (....................)

[B] Match each mixture with the suitable method of separation :

(A)	(B)
1. Salty solution	a. by filtration.
2. Sand and water	b. by evaporation.
3. Iron filings and sand	c. by separating funnel.
4. Mixture of oil and water	d. by magnetic attraction.
	e. by stirring.

1. .... 2. .... 3. .... 4. ....

28 El-Minia Governorate — Kawmia Language School

Answer the following questions :

1 [A] Choose the correct answer :

1. .... ejects a black colour fluid in the surrounding water when attacked by its enemies.
   a. Frog b. Sepia c. Chameleon
2. Red, green and blue lights are .... lights.
   a. primary b. secondary c. complementary
3. When a magnet is hanged freely, its north pole refers towards the ....
   a. east. b. west. c. north.

2 Part

4. The carton paper is a/an .... material.
   a. opaque   b. transparent   c. semi-transparent
5. The substance which dissolves in a solvent is called ....
   a. solute.   b. mixture.   c. solution.

[B] Compare between :

Points of comparison	Regular reflection	Irregular reflection
Definition :	....	....
Examples :	....	....

2 [A] Correct the underlined words in each of the following statements :

1. **Wood** is attracted to the magnet. (....................)
2. **Electric motor** converts kinetic energy into electric energy. (....................)
3. Solubility **decreases** by shaking and rising the temperature. (....................)

[B] Mention the kind of food relationship between each of the following :

1. Nodular bacteria and bean plant. (....................)
2. Sponge and tiny aquatic living organisms. (....................)
3. Bilharzia worm and human. (....................)

[C] Mention the function of :

Electric magnet.

....

....

3 [A] Write the scientific term :

1. The space around a magnet in which the magnetic force appears. (....................)
2. A natural area which includes living organisms and non-living things. (....................)
3. The change of light rays direction when they transmit through the separating surface between two different transparent media. (....................)
4. A tool that is used for locating the main four geographical directions. (....................)

[B] Give reasons for :

1. Air is considered as a mixture.

....

2. Predation is a temporary food relationship.

....

4 [A] Choose from (B) which is suitable for (A) :

(A)	(B)
1. Salty solution	a. is called common solvent.
2. Oil and water mixture	b. can by separated by a magnet.
3. Iron filings and sand mixture	c. can be separated by evaporation.
4. Pure water	d. can by separated by separating funnel.

1. .... 2. .... 3. .... 4. ....

[B] What happens if ... ?

1. Absence of saprophytic organisms.

....

2. White light passes through a glass prism.

....

Final Exams 2020

PART TWO

25 Final Exams of some Schools Governorates.

1 Cairo Governorate — St. Joseph's School

Answer the following questions :

1. [A] Put (✓) or (✗) and correct the wrong :

1. Red, green and yellow are primitive colours. ( )
2. Bilharzia is example of external parasite. ( )
3. Like magnetic poles repel. ( )
4. By increase temperature solubility time decrease. ( )
5. Yellow banana absorbs the all spectrum colors and reflects green colour. ( )
6. There is dark shadow for clear water. ( )

[B] What is the function of ... ?

1. Compass.

   ....

2. Camouflage for frog.

   ....

3. Stirring.

   ....

2. [A] Write the scientific term :

1. The magnetic pole that is attracts North pole of another magnet. (..................)
2. A set used to change mechanical energy into electric energy. (..................)
3. The food relationship in which the organism get its food by decomposing the dead bodies. (..................)
4. It is the balance among the components of ecosystem. (..................)
5. Materials allow some coloured light to pass through them. (..................)
6. A darkened area formed when light falls on an opaque object. (..................)

[B] What happens when ... ?

1. Blue light strikes red glass sheet.

   ....

2. Mixed a little amount of oil in water.

   ....

3. Sunlight falls on a plane mirror.

   ....

3. [A] Complete the following sentences :

1. .... process is used to separate salt from salty water while .... is used to separate iron from mixture of iron and sand.
2. Dieonea and .... are plants prey on insects to get required elements for making ....

PART 3

3. Mushroom is example of .... while commensalism is one type of .... relationship among living organisms.
4. Fruit salad is an example of .... mixture while soda water is an example of .... mixture.
5. From examples artificial magnets is .... while .... is temporary magnet.
6. Light .... into seven colours when passes through prism, but it .... when it passes from water to air.

[B] What is meant by ... ?

1. Coloured opaque object appear with its own colour.
....
....
2. Solvent.
....
....
3. Pure substance.
....
....

4. [A] Complete the table :

Name	The relation	The name of organism
1. Wolf and rabbit	.... (a)	The prey is (are) .... (d) ....
2. Nodular bacteria and bean plant	.... (b)	The benefit organism (or organisms) .... (e) ....
3. Mosquito and man	.... (c)	The parasite is (are) .... (f) ....

[B] Give reasons for :

1. Magnet attracts iron paper clips but it does not attract copper wire.
....
2. Sugar dissolves in 300 ml of water faster than in 150 ml of water.
....
3. White light is mixture colour not primitive colour light.
....

2 Cairo Governorate — El-Amal Language Schools

Answer the following questions :

1. [A] Complete the following sentences :

1. The food relationship in which both organisms get benefit from each other is known as ....

2. In salty solution, salt is the ……………, while water is the ……………
3. Sunlight is separated into …………… colours by passing it through a ……………
4. The magnetic force is most powerful at the …………… of the magnet.

[B] What happens when ... ?

1. Light falls on a shiny surface.
……………………………………………………………………………………
……………………………………………………………………………………
2. Bacteria completely disappear.
……………………………………………………………………………………
……………………………………………………………………………………
3. A strong magnet is put close to a piece of wood.
……………………………………………………………………………………
……………………………………………………………………………………

2. [A] Correct the underlined words :

1. Disc drive and electric mixer contain **dynamo**. (……………)
2. The object seems black as it **reflects** all the light colors. (……………)
3. The solubility speed **decreases** by shaking and rising the temperature. (……………)
4. Two different kinds of living organisms, where one of them benefits from the other while the other is harmed and infects with diseases is **saprophytism**. (……………)

[B] Study the following figures, then :



Figure (A)

- The figure represents the
……………………………
- Function ……………………………

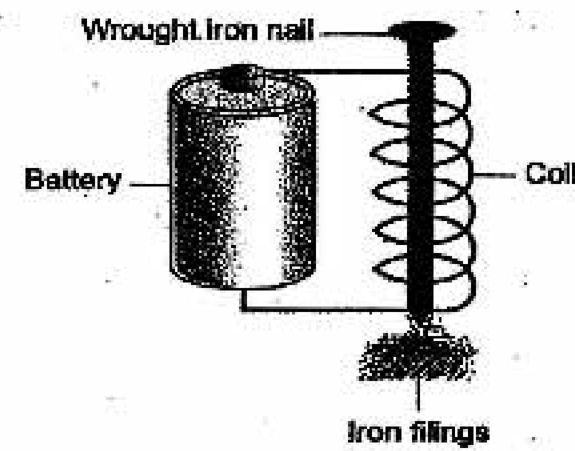


Figure (B)

- The figure represents the
……………………………
- Function ……………………………

[C] Give reasons for :

1. We must wear white clothes in summer season.
……………………………………………………………………………………
……………………………………………………………………………………

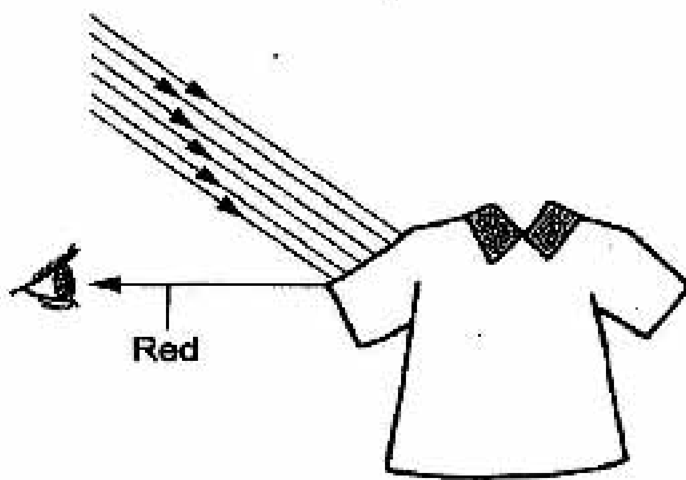
PART 3

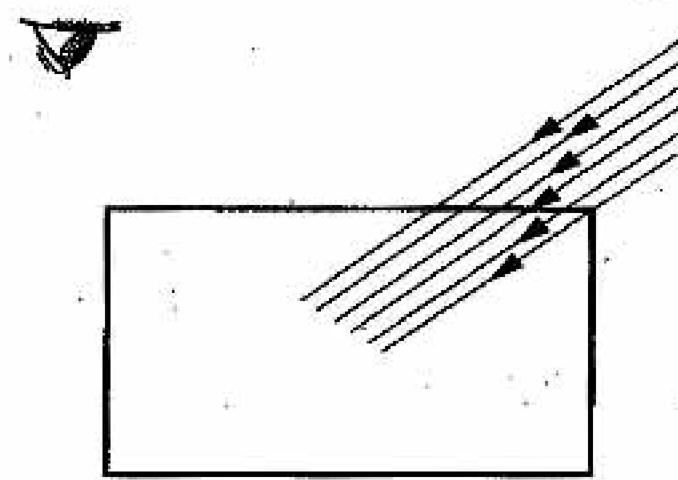
2. Some plants eat tiny insects.
....
....

3. **[A] Write the scientific term :**

1. A relation between two living organisms that benefit from each other. (..................)
2. A substance that consists of more than one type of particles. (..................)
3. The change in the direction of the light when it passes through two different transparent media. (..................)

[B] What is the colour of the body in each case ... ?





1. .... 2. ....

[C] Mention the relation between :

1. Lion and deer.
....
2. Sponge and the tiny aquatic living organisms.
....

4. **[A] Choose from column (A) what is suitable it from column (B) :**

(A)	(B)
1. Salt solution 2. Carton 3. Mushroom fungus 4. Light	a. opaque material. b. travels in straight line. c. reflects light. d. from saprophytes. e. mixture.

1. .... 2. .... 3. .... 4. ....

[B] Show how can you separate the following :

1. Sand – Water mixture.
....
2. Iron fillings from sand.
....

[C] Compare between :

Points of comparison	Primary coloured lights	Secondary coloured lights
Definition :	.... ①	.... ② ....
Examples :	.... ③	.... ④ ....

3 Cairo Governorate — Nozha Language Schools

Answer the following questions :

1. [A] Choose the correct answer :

1. Mixing all the primary coloured lights gives ....
   a. black light. b. white light. c. red light.
2. The speed of the solubility process .... by increasing the temperature.
   a. increases b. decreases c. doesn't change
3. The magnet has .... poles.
   a. 4 b. 3 c. 2
4. Bilharziasis disease is caused by ....
   a. bilharzia worm. b. filaria worm. c. mosquito.
5. The nearer objects to the light source has the .... shadow.
   a. smaller b. bigger c. fainted
6. .... is the food relationship that occurs between predator and prey.
   a. Symbiosis b. Saprophytism c. Predation
7. The white light splits into .... colours.
   a. 3 b. 6 c. 7

[B] Mention the name only of the following tool or process :

1. It is used to separate sand from water : ....
2. It is used to determine the four main direction : ....
3. It is used to separate the oil from water solution : ....

[C] What happens if ... ?

1. The electric current flows through a coil twisted around an iron nail.
....

PART 3

2. You put a part of the pencil in a cup of water.
....

2. [A] Write the scientific term :

1. The light energy that can be seen. (..................)
2. A natural area including living organisms and non living things. (..................)
3. The substance that is made of only one type of identical particles. (..................)
4. A phenomenon in which harmless living organism imitate other harmful or poisonous living organisms to frighten their enemies and escape from them. (..................)
5. It is the main source of light on the Earth. (..................)

[B] Correct the underlined words :

1. **Rainbow** is the darkened area that formed as a result of light falling on an opaque object. (..................)
2. The dynamo changes the **electric** energy into **magnetic** energy. (..................)
3. **Wolf** and **ascaris** hide from enemies by changing its colour to simulate the surrounding environment. (..................)
4. The **Prism** is used in electric bells and to lift tons of steel or iron. (..................)
5. Bouncing of light when it falls on a surface is called light **refraction**. (..................)

3. Complete the following sentences :

1. The clear water is a .... material while wood is .... material.
2. In salty solution, salt is the .... while water is the ....
3. .... and .... are from the shapes of the artificial magnets.
4. The relationship between nodular bacteria and bean plant is called ....
5. The secondary coloured lights are ...., ... and ....
6. The factors that affect the speed of solubility are temperature, ... and ....

4. [A] Put (✓) or (✗) :

1. The unlike poles of the magnets repel each others. ( )
2. Water is the most common solute. ( )
3. Nickel and iron are attracted to the magnet. ( )
4. Light travels in curved line. ( )
5. Predation is more common in plant world than that in animal world. ( )
6. The wire of the dynamo is made up of copper. ( )

[B] Choose from column (A) what is suitable it from column (B) :

(A)	(B)
1. Mosquito	a. make their food during photosynthesis process.
2. Commensalism	b. is considered from the insectivorous.
3. Drosera	c. is a food relationship between two living organisms where one of them get benefits from the other while the other neither gets benefit nor harmed.
4. Producers	d. is considered as an external parasitism.

1. .... 2. .... 3. .... 4. ....

[C] Give reasons for :

1. Milk is a mixture.

....

2. We must wear white clothes in summer.

....

4 Cairo Governorate — Basateen and Dar El-Salem Educational Administration

Answer the following questions :

1. [A] Choose the correct answer :

1. A sheet of aluminium foil is an example for .... material.
   a. transparent b. opaque
   c. translucent d. all the previous
2. Light travels in straight lines. This principle is the idea of making ....
   a. electric iron. b. radio. c. electric heater. d. camera.
3. If you put an object at a distance of 20 cm in front of a mirror, the distance between the image and the object equals ....
   a. 10 cm. b. 20 cm. c. 30 cm. d. 40 cm.
4. The speed of light in air is .... that in water.
   a. faster than b. slower than
   c. equal to b. half
5. Which of the following is magnetic material ? ....
   a. Chalk. b. Nail. c. Paper. d. Glass.
6. The dynamo generates .... energy from mechanical energy.
   a. thermal b. electrical c. light d. magnetic

PART 3

7. The magnet which is made by the effect of electricity is called ....
   a. natural magnet. b. electromagnet. c. magnetic. d. b and c
8. The process of photosynthesis is done by .... living organism.
   a. consumer b. producer c. decomposer d. saprophyte

[B] How can the following mixtures can be separated :

1. Paper clips and flour : ....
2. Mud in water : ....

2. [A] Write the scientific term :

1. A tool used to identify the four geographical direction. (..............)
2. The materials that don't attract to magnet. (..............)
3. The natural area that including living and non living things. (..............)
4. An apparatus used to separate immiscible liquid mixtures. (..............)

[B] What happens when ... ?

1. You suspend a bar magnet to move freely.
   ....
2. Mixing green and blue lights.
   ....

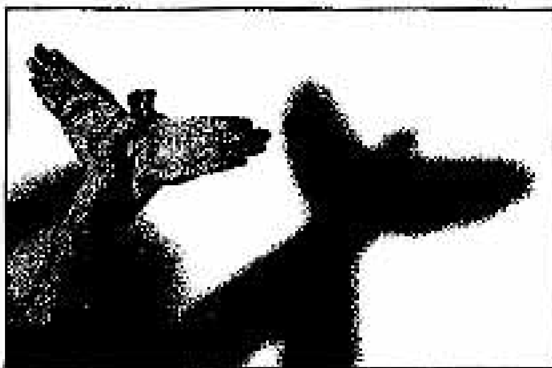
3. [A] Put (✓) or (✗) in front of the following statements :

1. When the white light strikes a red rose, it reflects the white light. ( )
2. The image formed by using narrow holes is maximized and inverted. ( )
3. The north pole of a magnet attracts the north of the other magnet. ( )
4. Blue, green and red lights are the primary coloured lights. ( )

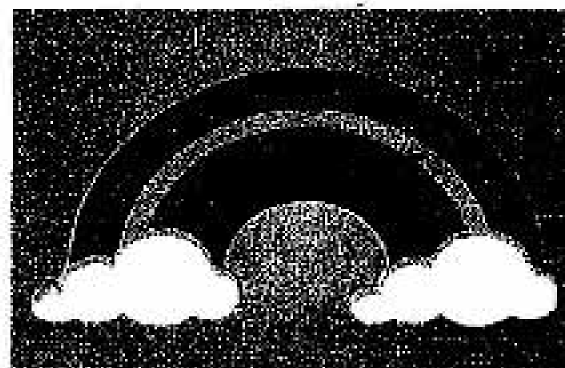
[B] Identify the type of the food relation among the following organisms using one of these choices : (Predation – Parasitism – Mutualism – Saprophytism)

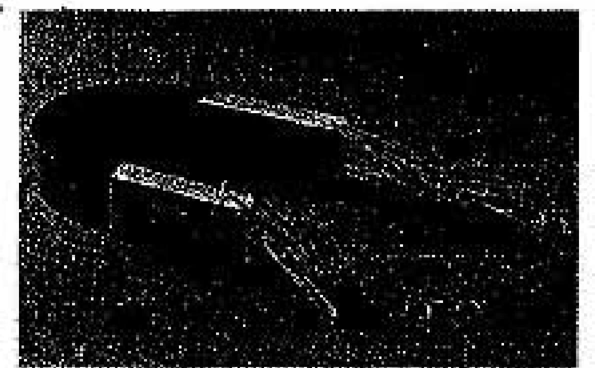
1. Bilharizia worm and man. (..............)
2. Lion and deer. (..............)
3. Nodular bacteria and roots of leguminous plants. (..............)
4. Bread mold fungus. (..............)

4. [A] Choose the correct answer for the following diagrams, then complete the following sentences :
(Light reflection – Rainbow – Light refraction – U shape magnet – Shadow)


a. ....


b. ....


c. ....


d. ....

1. The .... is the reason for seeing the spoon broken in the cup of water.
2. The nearer object to the light source has .... shadow.
3. Rainbow is formed due to the .... as each water drop acts as ....

[B] Give reasons for :

1. You can see your image on a plane mirror.

....

....

2. The formation of shadow.

....

....

5 Cairo Governorate — Nasr Official language School

Answer the following questions :

1. [A] Choose the correct answer :

1. All the following materials are not attracted to the magnet except ....
   a. plastic. b. paper. c. glass. d. nickel.
2. All the following are external parasites except ....
   a. lice. b. ticks. c. liver worm. d. lamprey.
3. The dynamo generates .... energy from the mechanical energy.
   a. heat b. electric c. light d. kinetic
4. When light passes from water to air, light is ....
   a. reflected. b. analyzed. c. refracted. b. collected.
5. The solvent in a mixture of chocolate and milk is ....
   a. milk. b. chocolate. c. water. d. oil.
6. All the following cause a disturbance to the environmental balance except ....
   a. cutting down trees. b. natural changes.
   c. disappearance of organisms. d. saprophytes.

[B] Give reasons for :

1. Plants are called autotrophic organisms.

....

2. A banana fruit seems yellow when sunlight falls on it.

....

3. Air is considered as a mixture.

....



PART 3

2. **[A] Complete the following sentences :**

1. .... and .... are from the ways of self-defence against predation in living organisms.
2. The object's image formed through narrow holes is .... and ....
3. Predators help preys in getting rid of .... or .... members.
4. The like poles .... each other, whereas the unlike poles .... each other.

[B] What is the importance ... ?

1. Electromagnet : ....
2. Glass prism : ....

3. **[A] Write the scientific term :**

1. A set that is used for locating the main four geographical directions. (..................)
2. A darkened area formed when light falls on an opaque object. (..................)
3. The space around a magnet in which the magnetic force appears. (..................)
4. The natural area which includes living organisms and non-living things. (..................)
5. The temporary food relationship that ends by devouring the prey or a part of it. (..................)
6. A set is used to separate water – oil mixture. (..................)

[B] Mention the kind of food relationship between each of the following :

1. Nodular bacteria and bean plant : ....
2. Fungi and dead organisms : ....

[C] What will happen when ... ?

1. A magnet is hanged to move freely.
....
2. Mixing red colour with green colour.
....

4. **[A] Put (✓) or (✗) in front of the following statements :**

1. The black opaque objects absorb all the light colours and reflect their own colour only. (   )
2. Blue, green and red lights are primary coloured lights. (   )
3. As the temperature of a solvent increases the solubility time decreases. (   )
4. Red is the first colour in the spectrum colours, but violet is the last colour. (   )

5. Internal parasites feed by sucking host's blood. ( )
6. Magnetism decreases as we go from two poles of magnet towards its middle. ( )

[B] How can you separate the following mixtures ... ?

1. Paper clips and flour : ....
2. Salt and water (salt solution) : ....

[C] Compare between :

Opaque materials	Transparent materials
....	....
....	....
....	....
....	....
....	....

6 Cairo Governorate — Manaret El-Eman Language School

Answer the following questions :

1. Choose the correct answer :

1. All the following are examples of mixtures except ....
   a. concrete. b. milk. c. sugar.
2. Dinosaurs are extinct animals due to ....
   a. pollution. b. over hunting.
   c. change in natural condition.
3. The primary colours are red, blue and ....
   a. magenta. b. green. c. yellow.
4. The food relation between cat and rat is an example of ....
   a. parasitism. b. predation. c. symbiosis.
5. The mixture of iron filings and sand can be separated by ....
   a. magnetic attraction. b. evaporation. c. filtration.
6. A black opaque object .... all the light colours.
   a. absorbs b. reflects c. refracts
7. The natural magnet is one of the .... ores.
   a. copper b. aluminium c. iron



PART 3

8. The coil of the dynamo is made up of ....
   a. plastic. b. carbon. c. copper.
9. Mixing red and blue gives ....
   a. cyan. b. magenta. c. yellow.
10. Bilharzia worm is an .... parasite.
   a. external b. internal c. both
11. A water pond is a .... ecosystem.
   a. small b. large c. very large
12. Solution is a ....
   a. mixture. b. solid. c. pure substance.

2. [A] Complete the following sentences :

1. Solubility process needs the presence of .... and ....
2. We can see ...., when sunlight passes through water droplets during rain fall.
3. Some types of mosquitoes infect .... with .... disease.
4. The speed of solubility .... by increasing stirring process.

[B] Mention one importance for the following ... ?

1. Glass prism :
   ....
2. Electromagnet :
   ....
3. Evaporation process :
   ....

[C] If you have a piece of iron and a bar of magnet, How can you differentiate between them (by using paper clips) ?

....
....

[D] Define ... ?

1. Energy :
   ....
2. Magnetic material :
   ....

3. [A] Write the scientific term :

1. A set used to generate the electric current by using a magnet and a coil. (..................)

2. Phenomenon in which organisms simulate the colour of the environment. (..................)

3. The natural area that includes living organisms and non-living things. (..................)

4. The light that is produced by mixing two primary coloured lights. (..................)

5. A set used to separate oil from water. (..................)

6. A tool that is used for locating geographic direction. (..................)

7. The substance in which the solute dissolves. (..................)

[B] Give reasons for :

1. Shadow is formed when light falls on an opaque object.

....

2. The pen appears broken in glass of water.

....

[C] Correct the underlined words :

1. **Alcohol** is a common solvent. (..................)

2. Natural magnet is a **red** rock. (..................)

3. Solubility **speed** decreases by rising the temperature. (..................)

4. [A] Put (✓) or (✗) :

1. The Sun is the main source of light on the Earth. (   )

2. Pure substance is the substance that is made of only one type of identical particles. (   )

3. Water, alcohol and benzene are examples for solvents. (   )

4. Filtration process is used to separate solid materials that are soluble in water. (   )

5. Vegetable salad is considered to be a homogeneous mixture. (   )

[B] Choose from column (A) what's suitable it from column (B) :

(A)	(B)
1. Jawless lamprey	a. is an internal parasite.
2. Light refraction	b. changes mechanical energy into electric energy.
3. Light reflection	c. is the return back of light when it falls on an object.
4. Electric generator	d. is the change of direction of light ray when it enters a new medium at an angle.
5. Ascaris worm	e. is an external parasite.

1. .... 2. .... 3. .... 4. .... 5. ....

PART 3

[C] What happens if ... ?

1. Red colour light falls on a white ball.

....

2. When a magnet is hanged freely to move.

....

7 Giza Governorate — El Agoza Educational Directorate

Answer the following questions :

1. [A] Complete the following sentences :

1. The spectrum colours start with .... and end with ....
2. Bilharzia worms hurt man and are named internal .... while the organisms they hurt are called ....
3. Iron filings and sand can be separated by .... while sand and water can be separated by ....
4. Mixing .... and .... Coloured lights gives yellow colour.

[B] What happens if ... ?

Putting the north poles of a magnet near the south pole of another magnet.

....

2. [A] Write the scientific term :

1. The relationship between a lion and a deer. (..................)
2. Tools used to locate the main four directions. (..................)
3. A process used to separate salt from water. (..................)
4. A dark area that is formed when light falls on an opaque object. (..................)

[B] Correct the underlined words :

1. Magenta is <u>a primary</u> colour. (..................)
2. Bread mold fungus is considered as <u>aparasite</u>. (..................)

3. [A] Choose the correct answer :

1. Light travels in .... lines.
   a. curved
   b. straight
   c. zigzag
   d. curved and zigzage
2. Plants that can't make their protein are called ....
   a. hosts.
   b. insectivorous plant.
   c. preys.
   d. parasites.

3. .... is a magnetic material.
   a. Gold   b. Iron   c. Copper   d. Aluminium
4. The material that dissolves to produce solution is called ....
   a. mixture.   b. solvent.   c. solute.   d. compound.

[B] Give reasons for :

1. Water is called a common solvent ?
   ....
2. Electromagnet is considered a temporary magnet ?
   ....

4. [A] Put (✓) or (✗) :

1. White paper absorbs all colours. (   )
2. Some types of mosquitoes infect man with malaria disease. (   )
3. Magnetism is always related with electricity. (   )
4. The direction of freely moving magnet is north - south direction. (   )

[B] Mention one use of :

1. Glass prism :
   ....
2. Electromagnet :
   ....

8 Giza Governorate — Child Home Language School

Answer the following questions :

1. Complete the following sentences :

1. Factors affecting solubility process are .... and ....
2. The magnet has .... poles which are .... and ....
3. The white light consists of ....
4. Mixing red and green light gives .... light colour.
5. Water and clear glass are .... media, while tissue paper is .... media.
6. The .... is the main source of light on the Earth.
7. When light falls on a dark body, it .... to my eyes.
8. .... is an example of external parasites.

2. [A] Give reasons for :

1. The green plants are autotrophic organisms.
   ....

PART 3

2. Table salt can be separated from sea water.

....

3. We must increase the number of coil turns in the electromagnet.

....

[B] Give one example for :

1. Large ecosystem :

....

2. Non-magnetic substance :

....

3. Non-living component of ecosystem :

....

4. Pure substance :

....

3. [A] Write the scientific term :

1. Mixing two primary coloured light blue and red produces. (....................)
2. Food relationship in which two organisms get benefit. (....................)
3. The change in the direction of light rays when they pass through two transparent medium. (....................)
4. The light energy that can be seen. (....................)

[B] Write one use for :

1. Compass :

....

2. Electromagnet :

....

3. Dynamo :

....

4. Glass prism :

....

4. [A] Put (✓) or (✗) :

1. Food relation in which decomposers get their food by decomposing food remains is known as saprophytism. (   )
2. Shark is an example of predator animal. (   )
3. Similar magnetic poles repel each other. (   )
4. Wood is an example of translucent material. (   )

[B] What happens if ... ?

1. Light rays fall on shiny surface.
....
....
2. You move a wire between two poles of a magnet.
....
....
3. The amount of the solute increases.
....

9 Giza Governorate — 6th October Educational Zone

Answer the following questions :

1. [A] Complete the following sentences :

1. The spectrum colours starts with .... and end with ....
2. The dynamo changes the .... energy into .... energy.
3. Examples of opaque materials are .... and ....
4. Mixing .... and .... coloured lights gives yellow colour.
5. Like poles .... each other where dislikes poles .... each other.

[B] Show how you can separate the following mixtures ?

1. Salt from salty water.
....
2. Iron filings from sand.
....

2. [A] Choose the correct answer :

1. Light travels in a .... line.
   a. curved b. straight c. zigzag d. curved
2. .... is a magnetic material.
   a. Gold b. Iron c. Copper d. Aluminium
3. An examples of decomposers is the ....
   a. fungi. b. rabbits. c. plants. d. lions.
4. If you look at a yellow banana through a green glass sheet it seems ....
   a. yellow. b. green. c. black. d. red.

PART 3

[B] Give reasons for :

1. The pen appears broken when put it in a cup of water.

 ....

2. Air is a mixture.

 ....

3. [A] Write the scientific term :

1. Any natural area contains living organisms and non-living things. (..................)
2. The main source of light on the Earth. (..................)
3. A device used to locate the four main geographical directions. (..................)
4. The darkened area formed as a result of falling light on an opaque object. (..................)
5. A phenomena where living organisms can change its colour to hide from its enemies. (..................)

[B] Mention one use of :

1. The electromagnet :

 ....

2. Glass prism :

 ....

4. [A] What happens when ... ?

1. If there are no predators.

 ....

2. The light when it falls on a smooth bright surface.

 ....

[B] Correct the underlined words :

1. Solubility speed **decrease** by rising the temperature. (..................)
2. Ascaris worms are **external** parasites. (..................)
3. Insectivorous plants cannot make **fats**. (..................)
4. **Alcohol** is called a common solvent. (..................)

10 Giza Governorate — Dar El-Hanan Language Schools

Answer the following questions :

1. [A] Complete the following sentences :

1. As the light falls on the green grass, the grass must absorb .... colours except ....

2. .... is considered as a common solvent due to its ability to dissolve several substances.
3. Green plants are .... organisms.

[B] Name the equipment that can be used in this case :

Converting of mechanical energy into electric energy.

....

2. [A] Put (✓) or (✗) and correct the wrong one :

1. Yellow, magenta and cyan are primary light colours. ( )
....
2. Light transmits in straight lines. ( )
....
3. The oil and water can be separated by filtration. ( )
....
4. Fungi feeding on the dead organisms bodies is called saprophyte. ( )
....

[B] Give reasons for :

1. The moon can't be considered as a source of light.
....
2. Air is a mixture.
....

3. [A] How can you separate the following mixtures ?

1. Sand solution.
....
2. Paper clips and flour.
....
3. Salty solution.
....
4. Water containing mud.
....

[B] Write one difference between the following :

The magnetic and non-magnetic materials.

....
....

4. [A] Write the scientific term :

1. A temporary relationship between two different organisms with a benefit to one and harm to the other. (..................)
2. Darkened area formed behind an object once light falls on it. (..................)



PART 3

3. A tool that is used for locating the main four geographic directions. (................)

4. The material at which the solute disappear in it. (................)

[B] What happens if ... ?

1. When you look at a spoon put in a beaker contains water.

....

2. Cutting down of trees.

....

11 Alexandria Governorate — East Alex. Educational Zone

Answer the following questions :

1. [A] Complete the following sentences :

1. Like magnetic poles .... each other, while unlike magnetic poles .... each other.
2. .... and .... are ways of self-defense against predation.
3. Light cannot pass through .... materials.
4. .... substance consists of one type of identical particles.

[B] Correct the underlined words :

1. Light travels in **curved** lines. (................)
2. The magnet has **three** poles. (................)
3. Bread mold fungus is a **predator**. (................)

2. [A] Write the scientific term for each of the following :

1. The living organisms that clean the Earth's surface from dead bodies. (................)
2. A device which is used to change magnetic energy into electric energy. (................)
3. The objects that absorbs all light colours that fall on them. (................)
4. The commen solvent that has the ability to dissolve several substances. (................)

[B] What happens when ... ?

1. Passing of electric current in a coil around a rod of soft iron.

....

2. Heating salty water for a long time.

....

3. **[A] Choose the correct answer :**

1. The jawless lamprey is a ....
   a. host. b. parasite. c. predator.
2. If you look at a red apple through red glass sheet, it looks ....
   a. blue. b. red. c. black.
3. A pencil is seen broken in a cup of water due to light ....
   a. refraction. b. reflection. c. separation.
4. Solubility process is affected by ....
   a. heating. b. stirring. c. heating and stirring.

[B] Mention the kind of food relationship for each the following :

1. Nodular bacteria and bean plant.
   ....
2. Sponge and tiny aquatic living organisms.
   ....

4. **[A] Cross the odd word out :**

1. Distilled water - Mineral water - Vegetable salad - Fruit salad. (..................)
2. Wood - Plastic - Iron - Glass. (..................)
3. Air - Clear water - Frosted glass - Glass. (..................)

[B] Give reasons for :

Compass is used in planes.
....
....

[C] Mention the way of separating the following mixtures :

1. Oil and water.
   ....
2. Sand and iron filing.
   ....

12 Alexandria Governorate — El-Gomrok Educational Zone

Answer the following questions :

1. **[A] Choose the correct answer :**

1. The substance in which solids dissolve is called ....
   a. solubility process. b. solvent. c. solute. d. sugar.

PART 3

2. We can see objects due to .... of light on them.
   a. reflection
   b. refraction
   c. shadow
   d. spectrum colours
3. A scientist who discovered that the magnetic energy can be changed into electrical energy ....
   a. Newton.
   b. Faraday.
   c. William Gelbert.
   d. Hasan ibn al-hatham.
4. An .... is any nature area including living organisms and non-living things.
   a. ecosystem
   b. artificial
   c. saprophytes
   d. (a), (b) and (c)

[B] Mention one use of :

1. Glass prism.

....

2. Separating funnel.

....

2. [A] Complete the following statements :

1. .... is considered a common solvent.
2. Increasing .... reduces the solubility time.
3. The food relationship in which one living organism devours another one is know as ....
4. The like poles .... each other, whereas the unlike poles .... each other.

[B] Give reasons for :

1. Some materials are called magnetic materials.

....

2. Formation of images through narrow holes.

....

3. [A] Write the scientific term :

1. A set is used for locating the main four geographical directions. (..................)
2. The phenomena in which a living organism can change its colour to hid from its enemies. (..................)
3. The substance that consists of more than one type of identical particles. (..................)

[B] Choose from column (B) what is suitable it from column (A) :

(A)	(B)
1. Saprophytism	a. the relationship between man and worms.
2. Mutualism	b. a relationship between fungi and food remains.
3. Parasitism	c. the relationship between the nodular bactria and legumes plant.

1. .... 2. .... 3. ....

4. [A] Correct the underlined words :

1. Sand and water mixtures can be separated by **magnetic attraction**. (..................)
2. The electromagnet changes electric energy into **heat** energy. (..................)
3. Mosquito conveys **plugs** disease to man. (..................)
4. red, green and blue are called **secondary** colours. (..................)

[B] What happens when :

1. On mixing the red colour with the green colour.
....
2. Bactria disappear completely.
....

13 Alexandria Governorate — South Alex. Educational Zone

Answer the following questions :

1. [A] Correct the underlined words :

1. Concrete and tomato sauce are considered a **pure substance**. (..................)
2. Ascaris worms are **external** parasites. (..................)
3. Light travel in **curved lines**. (..................)
4. **Alcohol** is called a common solvent. (..................)
5. By increasing the temperature the time taken to dissolve solute **increases**. (..................)
6. A magnet has **three** poles. (..................)

[B] What happens when ... ?

1. A magnet is hanged freely to move.
....
2. Approaching a magnet to mixture of sand and steel paper clips.
....
3. Looking at red apple through green glass sheet.
....

PART 3

2. [A] Classify :

Copper – Nickel – Chalk pieces – Aluminium – Paper clips – Iron

Magnetic materials	Non-magnetic materials
....	....
....	....
....	....
....	....
....	....

[B] Give reasons for :

1. Sugar is a pure substance.
....
....
2. Spoon apears broken in transparent cup filled with water.
....
....

3. [A] Write scientific term :

1. The plants that devours tiny insects. (..................)
2. A set used to identify the main four directions. (..................)
3. A form of energy which can be seen. (..................)
4. It is the substance that dissolves in solvent. (..................)
5. Any natural area including living organisms and non-living things. (..................)
6. Darkened area formed behind an object once light falls on it. (..................)

[B] Choose from column (A) what is suitable with column (B) :

(A)	(B)
1. The relation between a cat and a rat is 2. A food relationship between two organisms benefit from each other 3. Falaria worm	a. causes elephantiasis disease. b. mutualism. c. predation.

1. .... 2. .... 3. ....

4. [A] Complete the following sentences :

1. Like magnetic poles .... each other, while the dislike magnetic poles ....
2. You can separated a mixture of oil and water by ....
3. From primary light .... , ... , ...

[B] Choose the correct answer :

1. Mosquito conveys ·············· disease to man.
   a. plague b. malaria c. elephantiasis
2. To separate salt from salty water we use ··············
   a. filter paper. b. a separating funnel.
   c. the evaporation process.
3. The natural magnet is one of the ·············· ores.
   a. copper b. carbon c. iron
4. Green plants are considered ·············· organisms.
   a. decomposer b. producer c. parasite
5. Chameleon tends to make ··············
   a. mimicry. b. camouflage. c. symbiosis.
6. Filtration is used to separate ·············· mixture.
   a. salt and surge b. iron filings and sand c. sand and water

14 El-Qalyoubia Governorate — Science Inspectorate

Answer the following questions :

1. [A] Complete the following sentences :

1. The spectrum colours start with ·············· and end with ··············
2. By increase the quantity of solvent the solubility time ··············
3. The idea of electric generator is change ·············· energy into ·············· energy
4. The relationship between sponge and tiny aquatic living organisms is ··············
5. Sand-water mixture can be separated by ··············
6. ·············· worm causes elephantiasis disease.

[B] Choose the correct answer :

1. Predation ·············· the number of prays in the ecosystem.
   a. increases b. decreases c. organizes
2. ·············· is used to located the main four directions.
   a. Compass b. Dynamo c. Prism
3. The blue t-shirt seems ·············· behind red glass sheet.
   a. blue b. red c. black
4. The common solvent is ··············
   a. alcohol. b. water. c. benzene.

PART **3**

2. **[A] Give reasons for :**

1. The image through narrow holes is inverted and minimized.

....

2. Predation is temporary food relationship.

....

3. Mineral water is a mixture but sugar is pure substance.

....

4. Yellow is called secondary coloured light.

....

[B] Correct the underlined words :

1. **Newton** is the scientist who discovered dynamo. (..................)
2. Ascaris worm is **external** parasite. (..................)
3. **Aluminium** is a magnetic material. (..................)
4. Salt and water are mixed by **grinding**. (..................)

3. **[A] Write the scientific term :**

1. A darkened area formed when light falls on opaque object. (..................)
2. Any natural area contains living organisms and non-living things. (..................)
3. The food relationship between nodular bacteria and leguminous. (..................)
4. A set used to change electric energy into magnetic energy. (..................)

[B] Put (✓) or (✗) :

1. Insect-eaters plants prey insects to prepare fats. (   )
2. Mixing red, green and blue produce white light. (   )
3. Air is transparent material. (   )
4. The formed image in the mirror due to light refraction. (   )

4. **[A] What happens when ... ?**

1. Hanging a bar magnet to move freely.

....

....

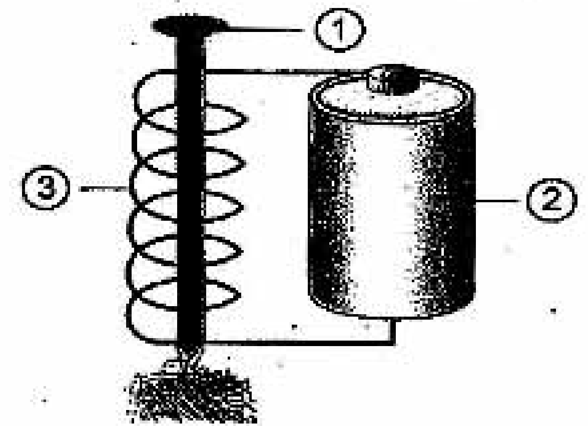
2. Bacteria disappear from environment.

....

....

[B] Look at the opposite figure then answer :

1. The figure represent ....
2. Label the figure :
   ① ....
   ② ....
   ③ ....



[C] Choose from column (B), what is suitable it from column (A) :

(A)	(B)
1. Bread mold fungi	a. mixtures
2. Salt and sugary solutions	b. appear after rains
3. Tissue paper	c. translucent
4. rainbow	d. saprophytes

1. .... 2. .... 3. .... 4. ....

15 El-Gharbia Governorate — Gharbia Educational Directorate

Answer the following questions :

1. [A] Complete the following sentences :

1. Yellow, ... and .... are known as "secondary light colours".
2. Like poles .... each other, whereas unlike poles .... each other.
3. It is possible to separate iron flings from the mixture by using .... while .... is used to separate salt from sea water.
4. Mosquito is an .... parasite, while ascaris worm is an .... parasite.

[B] Compare between each of the following :

1. Magnetic materials and non-magnetic materials. (According to definition)
   ....
   ....
2. Pure substances and mixtures. (According to their structure)
   ....
   ....

2. [A] Choose the correct answer :

1. Red light + Green light + Blue light = ...
   a. Yellow. b. Magenta. c. White.
2. A tool that is used for locating the four main directions ....
   a. dynamo. b. compass. c. electric lamps.



PART 3

3. Increasing temperature .... solubility time.

a. increase b. decreases c. does not effect

4. An example of decomposers is the ....

a. fungi. b. rabbits. c. plants.

[B] What happens when ... ?

1. You look at a red apple through a green transparent glass sheet.

....

2. Bacteria disappeared completely.

....

3. [A] Write the scientific term :

1. The seven colours which the white light is made up of. (..................)
2. One of the iron ores which is known as magnetite. (..................)
3. It is the substance in which the solute disappears. (..................)
4. It is the food relationship among living organisms in which one living organism devours another one. (..................)

[B] Give reasons for :

1. The pencil placed inside a glass of water seems as if it was broken at the water's surface ?

....

....

2. Water is a common solvent.

....

....

4. [A] Put (✓) at the front of the right statement and (✗) at the front of the wrong one :

1. Object's image is formed because light travels in curved lines. ( )
2. When the white light strikes a red rose, it reflects the white colour. ( )
3. A separating funnel is used to separate immiscible liquid mixtures. ( )
4. Green plants are considered as consumer organisms. ( )

[B] Choose one of the following terms to form a proper food chain :

(Snake – Wheat – Sheep)

1. The producer in the chain is ....
2. The predator in the chain is ....
3. The herbivore in the chain is ....
4. The relationship between a snake and a rat is known as a ....

16 Dakahlia Governorate — Science Inspectorate

Answer the following questions :

1. [A] Choose the correct answer :

1. Mixing green light with red light produces .... light.
   a. cyan b. yellow c. magenta d. blue
2. .... is a common solvent.
   a. Water b. Alcohol c. Mercury d. Benzene
3. Black opaque object .... all light coloures.
   a. absorbs b. reflects c. transmits d. all the previous
4. .... is attracted to th magnet.
   a. Chalk b. Glass c. Cobalt d. Aluminium
5. When you look at a red apple from a yellow glass sheet, the apple seems ....
   a. red. b. blue. c. black. d. yellow.
6. The solute in chocolate-milk solution is ....
   a. milk. b. chocolate. c. water. d. all the previous.

[B] Give reasons for :

1. Formation of shadow when light falls on an apaque body.
   ....
   ....
2. Mineral water is considered as a mixture.
   ....
3. We see a picture behind the glass clearly.
   ....
   ....

2. [A] Complete the following sentences :

1. .... is any .... area including living and nonliving organisms.
2. When light passes from water to air it .... because light speed through air is .... than that through water.
3. Electromagnet changes .... energy to .... energy.
4. The substances can be divided into .... and .... due to their magnetic ability.

PART 3

[B] Show how can separate the following ?

1. Salt from salty solution. (..................)
2. Chalk powder from water. (..................)
3. Oil from oil-water mixture. (..................)
4. Steel paper clips and flour. (..................)

3. **[A] Correct the underlined words :**

1. Natural magnet is one of the **copper** ores.. (..................)
2. The green colour is between yellow and **indigo** in rainbow. (..................)
3. Very large ecosystem as **desert**. (..................)
4. **Camouflage** helps in keeping the environment balance. (..................)
5. Yellow light is a **primary** colour. (..................)
6. **The motor** is used in making electric bell. (..................)

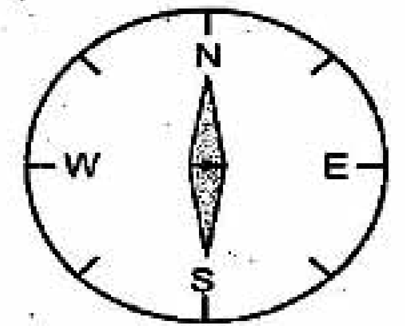
[B] Write the scientific term :

1. The region of the magnet where the magnetic force is the most powerful. (..................)
2. A mixture in which solute disappeared in the solvent. (..................)
3. The light energy that can be seen. (..................)
4. The type of material which appears with the reflected colour. (..................)
5. An insectivorous plant. (..................)
6. The organism that feeds on decomposing the moist wet bread. (..................)

4. **[A] Mention the kind of relation between each of the following :**

1. Lion and deer. (..................)
2. Bread mold fungus and moist bread. (..................)
3. Nodular bacteria and bean plant. (..................)
4. Mosquitoes and man. (..................)

[B] Look at the opposite figure then answer the following :



1. The opposite figure represents ....
2. The device consists of .... can spin freely around a fixed axis.
3. It is used to ....

[C] What happen when ... ?

1. When you look at a spoon placed in glass contains water.

....

....

2. When a man infected by filaria worm.

....

17 Ismailia Governorate — Science Inspectorate

Answer the following questions :

1. **[A] Complete the following sentences :**

1. White light consists of .... colours, which are called .... colours.
2. Solid materials can be mixed by .... or ....
3. The .... magnet is black stone made of iron ores which called ....
4. The like poles .... each other, whereas the .... poles attract each poles.

[B] Choose from column (B) what is suitable it in column (A) :

(A)	(B)
1. Sugar	a. causes malaria disease.
2. Air	b. get by mixing two primary colours.
3. Mushroom fungus	c. is a mixture.
4. Secondary light colours	d. is from saprophytes.
	e. is a pure substance.

1. .... 2. .... 3. .... 4. ....

2. **[A] Give reasons for :**

1. When light fall on a white paper, it appears white colour.

....

2. The formation of image through narrow holes.

....

3. It is preferable to increase the number of coil turns in the electromagnet.

....

PART 3

[B] Write the scientific term :

1. The phenomenon formed in the sky after rain and sun still shining. (................)
2. The substance which dissolves in a solvent. (................)
3. The food relationship between two living organisms that benefit from each other (................)
4. The materials that are attracted to the magnet. (................)
5. It is the internal parasite which causes bilharzia disease. (................)
6. Darkened area that formed as a result of falling light on an opaque object. (................)

3. [A] Mention an example for each of the following :

1. A natural source of light. (................)
2. A common solvent. (................)
3. Insectivourous plants. (................)
4. Large ecosystem. (................)

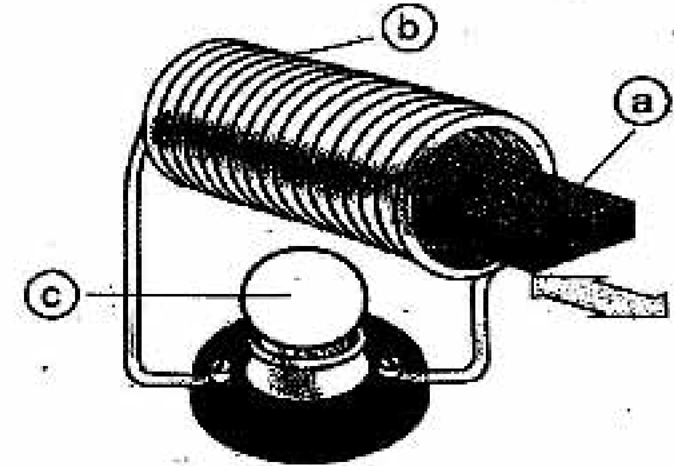
[B] Look at the opposite figure then answer :

1. The name of the device is ....
2. Lable this diagram

ⓐ ....

ⓑ ....

ⓒ ....



4. [A] Identify the ways of mixtures separation by but (✓) in front of suitable way :

Mixtures	Magnetic attraction	Filtration	Separating funnel	Evaporation
1. Oil and water	....	....	....	....
2. Suger and water	....	....	....	....
3. Iron filling and sand	....	....	....	....
4. Sand and water	....	....	....	....

[B] What happened when ... ?

1. You look at a red apple through a green glass sheet.

....

2. Hanging a magnet and allow it to move freely.

....

18 Port Said Governorate — Science Inspectorate

Answer the following questions :

1. Complete the following sentences :

1. The material in which light can transmit through is called ....
2. Like poles .... whereas dislike poles ....
3. The food relationship between cat and rat is ....
4. .... is a common solvent due to its ability to dissolve several substance.
5. Red light + Green light + Blue light = ...

2. [A] Choose the correct answer :

1. Light transmits in .... lines.
   a. curved b. broken c. straight
2. The material that dissolves to produce solution is called ....
   a. solvent. b. solute. c. mixture.
3. The natural magnet is discovered since .... ago.
   a. 2000 b. 3500 c. 2050
4. .... takes place by some living organisms to hide from their enemies.
   a. Commensalism b. Parasitism c. Camouflage

[B] Choose from the column (A) what is suitable it from column (B) :

(A)	(B)
1. A mosquito	a. causes elephantiasis.
2. Flaria worm	b. conveys plague.
3. Bread mold fungus	c. causes malaria.
4. Fleas	d. causes bread mold.

1. .... 2. .... 3. .... 4. ....

3. [A] Write the scientific term :

1. Darkened area formed behind an object once light falls on it. (..................)
2. Natural area including living organisms and non-living things. (..................)
3. A device used to convert kinetic energy into electric energy. (..................)

[B] Correct the underlined words :

1. When white light strikes a red rose, it reflects the **white** colour. (..................)
2. Increasing solvent amount, **decreases** the speed of solubility. (..................)
3. Salt and water are mixed together by stirring or **grinding**. (..................)

PART 3

4. **[A] Give reasons for :**

Some materials are magnetic.

....

[B] What happens when ... ?

On mixing the red coloured light with the green coloured light.

....

[C] Identify the ways of mixtures separation by put (✓) in front of suitable way :

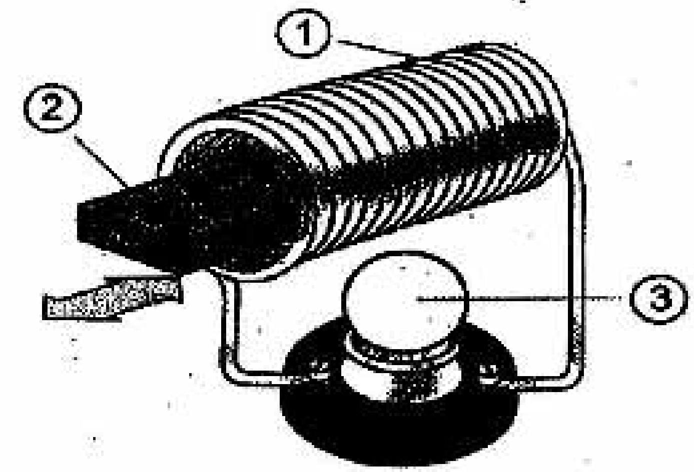
The mixture	Magnetic attraction	Filtration	Evaporation	Separation funnel
1. Iron filings and sand	....	....	....	....
2. Sand and water	....	....	....	....
3. Oil and water	....	....	....	....
4. Salt and water	....	....	....	....

[D] Study the following figure then complete :

① ....

② ....

③ ....



19 Damietta Governorate — Science Inspectorate

Answer the following questions :

1. **[A] Complete the following sentences :**

1. The material in which light can transmit through is called ....
2. Fungi are considered as .... living organisms.
3. Increasing .... reduces solubility time.
4. Like poles .... each other.

[B] What is meant by each of the following ... ?

1. Ecosystem.

....

2. Shadow.

....

2. **[A] Choose the correct answer :**

1. Light travels in .... lines.
   a. Curved b. straight
   c. zigzag d. Curved and zigzag
2. Green plants are considered as .... organisms.
   a. decomposer b. consumer c. producer d. parasitic
3. The material that dissolves to produce solution is called ....
   a. solute. b. solvent. c. mixture. d. compound.
4. When a magnet is suspended freely, the magnet takes .... direction.
   a. north-south b. east-west c. north-east d. north only

[B] Give reasons for :

1. We wear black clothes in winter.
   ....
   ....
2. Aluminium and copper are considered as non-magnetic materials.
   ....
   ....

3. **[A] Write the scientific term :**

1. A tool used to locate the main four directions. (....................)
2. A process used to separate salt from water. (....................)
3. A temporary relationship between two different organisms with a benefit to one and harm to the other. (....................)
4. Is a mixture of gases such as oxygen, nitrogen and carbon dioxide. (....................)

[B] Mention one use for each of the following :

1. Glass prism ....
2. Electromagnet ....

4. **[A] Correct the underlined words in each of the following statements :**

1. Separating funnel is used to separate the **solid-liquid mixture**. (....................)
2. Natural magnet is a **red** rock. (....................)
3. Red light + Green light = **Cyan** light. (....................)
4. **Mimicry** is a phenomenon in which the living organism protects itself from enemies by changing its colour. (....................)

PART 3

[B] What do you except to happen in the following case ... ?

1. Seven spectrum colours are mixed together.

....

2. Adding an insoluble substance to a certain solvent.

....

20 Fayoum Governorate

Science supervision for governmental language school

Answer the following questions :

1. Complete the following :

1. Mixing a small amount of mud with water forming .... solution that can be separated by ....
2. Like poles .... whereas dislike poles ....
3. The material in which light can transmit through is called ....
4. .... is considered to be a general solvent because of its ability of dissolving most materials

2. Correct the underlined words in each of the following statements :

1. Solubility speed **decreases** by shaking and rising the temperature. (..................)
2. **Parasites** get their food by decomposing food remains or dead bodies. (..................)
3. The formation of shadow due to traveling light in **curved** lines. (..................)
4. **Copper** is attracted to the magnet. (..................)
5. When light passes from air to glass, it **reflects**. (..................)
6. Frog hides from its enemies by **mimicry**. (..................)

3. Choose the correct answer :

1. The dynamo generates .... energy from mechanical energy.
   a. thermal b. electrical c. light d. kinetic
2. When a magnet is hanged freely, its north pole refers towards the ....
   a. north. b. south. c. east. d. west.
3. In food relationship between a man and a bilharzias worm, the man is a ....
   a. predator. b. prey. c. host. d. parasite.
4. The process of photosynthesis is done by a .... living organism.
   a. producer b. decomposer c. consumer d. all the previous

5. .... is used to separate a mixture of oil and water.
a. Evaporation
b. Filtration
c. Separating funnel
d. Magnetic attraction

6. Red, green and blue light are .... lights.
a. primary
b. secondary
c. complementary
d. mix

4. **[A] Write the scientific term for each of the following statements :**

1. The liquid mixture which is composed of a solute and a solvent. (....................)
2. The natural area including living organisms and non-living organisms. (....................)
3. The materials that don't get attracted to the magnet. (....................)
4. The seven colours of light which sunlight (white light) is made up of. (....................)

[B] Give reasons for :

1. A magnet can be used to separate iron fillings from sand.
....
2. We prefer to wear black clothes in winter.
....

21 El-Minia Governorate — St. Mark and El-Tawfik Schools

Answer the following questions :

1. **Choose the correct answer :**

1. .... materials don't allow light to travel through.
a. Transparent
b. Translucent
c. Semi-transparent
d. Opaque

2. An orange appears .... when you look at it through a blue transparent glass sheet.
a. red
b. yellow
c. green
d. black

3. The space around a magnet in which the magnetic force appears is called ....
a. magnetic pole.
b. magnetic substance.
c. non magnetic substance.
d. magnetic field.

4. The coil of a dynamo is made up of .... wire.
a. carbon
b. copper
c. plastic
d. graphite

PART 3

5. All these factors affects solubility process except ....
   a. temperature.   b. colour of solvent.
   c. stirring.   d. type of solute.
6. Predation relationhship .... the number of preys in populations.
   a. increases   b. organizes   c. decreases   d. prevents

2. [A] Write the scientific term :

1. A darkened area formed when light falls on an opaque object. (..................)
2. The light that we can get by mixing two of the primary coloured lights. (..................)
3. A set that is used for locating the main four geographic directions. (..................)
4. A set that is used to change mechanical energy into electric energy. (..................)
5. The temporary food relationship that ends by devouring the prey or part of it. (..................)

[B] Give reasons for the following :

1. Copper is a non-magnetic substance.
   ....
2. The formation of images through narrow holes.
   ....

3. [A] Complete the following sentences :

1. When a light ray passes from a glass rod to air, it ....
2. Red light + Green light + Blue light = ...
3. The like poles .... each other, whereas the dislike poles .... each other.
4. The basic idea of working of the electromagnet is the changing of .... energy into .... energy.
5. In salty solution, salt is the .... while water is the ....

[B] Choose from column (A) what is suitable it from column (B) :

(A)	(B)
1. Food relation between sponge and tiny aquatic living organisms	a. predation.
2. Food relation between man and liver worm	b. mutualism.
3. Food relation between plant and nodular bacteria	c. internal parasitism.
4. Food relation between a cat and a rat	d. commensalism.

1. ....   2. ....   3. ....   4. ....

4. **[A] Put (✓) or (✗) then correct the wrong ones :**

1. The formed image through narrow holes is inverted. ( )
2. An object seems white as it reflects all light colours. ( )
3. Distilled water is a mixture, while mineral water is a pure substance. ( )
4. Mosquitoes infect man with elephantiasis. ( )

[B] Show how you can separate the following :

1. Iron filings from sand.

....

2. Salt from salty water.

....

3. Oil from oil – water mixture.

....

4. Sand from water – sand mixture.

....

22 Assiut Governorate — Science Inspectorate

Answer the following questions :

1. **[A] Complete the following sentences :**

(predation – poles – solution – repel – attract)

1. Solute + solvent + $\xrightarrow[\text{process}]{\text{dissolving}}$ ....
2. Like poles .... wheares unlike poles ....
3. The magnetic force is most powerful at the ....
4. The interaction between a cat and a rat is considered as an example of .... relationship.

[B] Define the following by using the following sentences :

(It is a natural area that contains living organisms, non-living things and the components of air including gases), It means the balance among the components of the ecosystem.

1. The ecosystem.

....

2. Environmental balance.

....

2. **[A] Write the scientific term :**

1. The materials that get attracted to the magnet. (...................)
2. Yellow, magenta and cyan colours. (...................)



PART 3

3. The seven colours of light which sunlight is made up of. (..................)
4. A tool that is used for locating the four main direction. (..................)

[B] Give reasons for :

1. Tape worm is a parasite.

....

2. An apple appears red when sunlight falls on it.

....

3. [A] Put (✓) or (✗) :

1. Solubility decreases by shaking and rising the temperature. (   )
2. Aluminium gets attracted to the magent. (   )
3. Object's shadow is formed because the light travels in curved lines. (   )
4. Fruit salad is considered a mixture. (   )

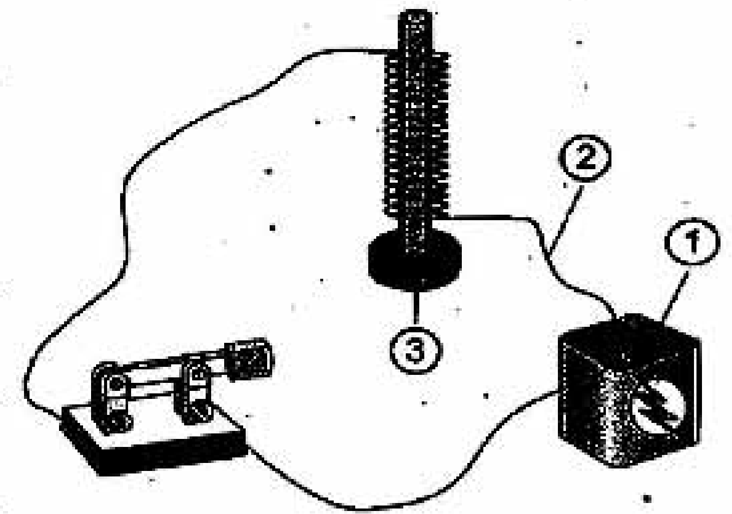
[B] Look at the opposite figure, then answer :

- The figure represents ....
- Label the figure

① ....

② ....

③ ....



4. [A] Choose the correct answer :

1. The coil of a dynamo is made up of ....
   a. copper. b. carbon. c. iron.
2. Light can easily transmit through .... materials.
   a. transparent b. semi-transparent c. opaque
3. When a magnet is hanged freely it will take the direction ....
   a. north and east. b. north and south. c. east and west.

[B] How can the following mixtures be separated ?

1. Water and oil solution.

....

2. Sand solution.

....

3. Sand and iron filings.

....

23 Aswan Governorate — New Aswan Distinct Official Language School

Answer the following questions :

1. [A] Complete the following sentences :

1. Like poles .... each other.
2. Light travels in .... line.
3. The prism separates sunlight into ....
4. The relationship between a scaris worm and a man is known as ....

[B] Give reasons for :

1. The banana appears yellow when sunlight falls on it.

....

2. Predation is temporary relationship.

....

2. [A] Choose the correct answer :

1. A materials that light cannot transmit through are ....
   a. transparent. b. semi-transparent. c. opaque.
2. The coil of a dynamo is made up of .... wire.
   a. copper b. carbon c. iron
3. Magenta, cyan and yellow light are .... lights.
   a. primary b. secondary c. complementary
4. Uses .... in separation of a mixture of water and oil.
   a. evaporation b. filtration c. separating funnel

[B] Mention the function each of :

1. The dynamo.

....

2. Compass.

....

3. [A] Put (✓) or (✗) :

1. Light is a form of energy. ( )
2. Aluminium gets attracted to the magent. ( )
3. Red + Green + Blue = White. ( )
4. Spiders use their woven nets for catching insects. ( )

PART 3

[B] Complete the table :

Point of comparisons	Camouflage	Mimicry
Example	.... ①	.... ② ....
Point of comparisons	Mixture of sand and iron filings	Mixture of sand and water
Methods of separation	.... ③	.... ④ ....

4. [A] Write the scientific term :

1. The darkened area formed behind an object once light falls on it. (..................)
2. The change of light rays directions when they transmit the separate surface between two different transparent media. (..................)
3. Liquid used to dissolve the solute to make a solution. (..................)
4. The relationship between two organisms that benefit from each other. (..................)

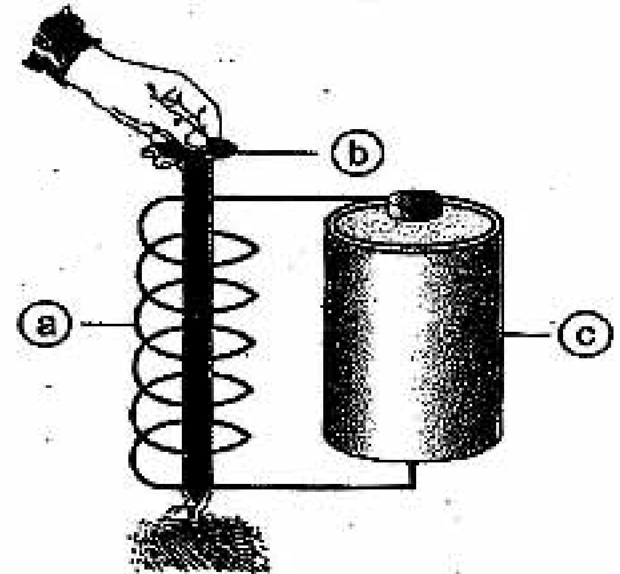
[B] Look at the opposite figure, and write the Labels :

- The name of the device ....
- Label the figure

ⓐ ....

ⓑ ....

ⓒ ....



24 Luxor Governorate — Luxor Educational Zone

Answer the following questions :

1. [A] Complete the following sentences :

1. Bilharzia worms hurt .... and are named .... while the organisms it hurts are called hosts.
2. Increasing .... reduces the solubility time.
3. Compass consists of .... freely move.

4. Secondary colours are .... , ... and ....
5. Like poles .... each other.

[B] Name the equipment that can be used in each case :

1. Separation of light into seven colours. (............)
2. Converting of mechanical energy into electric energy. (............)

2. [A] What happens in each case of the following ... ?

1. When you look at a spoon put in a beaker contains water.
....
2. Cutting down of trees.
....
3. On mixing the seven colours.
....

[B] Correct the underlined word :

1. The natural magnet is one of the **copper** ores. (............)
2. Shadow is formed because light travels in **curved** lines. (............)
3. Spiders uses their woven nest for catching **fishes**. (............)

3. [A] Choose the correct answer :

1. Light travels in .... lines.
   a. curved b. zigzagged c. straight
2. From examples of saprophytic organisms ....
   a. fungi. b. rabbit. c. plant.
3. The solute in the mixture of chocolate and milk is ....
   a. water. b. milk. c. chocolate.
4. The types of parasites are ....
   a. external. b. internal. c. all the previous.
5. The natural magnet is discovered since .... ago.
   a. 2000 b. 2020 c. 2500

[B] Mention the kind of food relationship between :

1. The lion and a deer : ....
2. Nodular bacteria and bean plant : ....

4. [A] Give reasons for :

1. Wood is a non-magnetic material.
....

PART 3

2. A piece of marble isn't disappearing when putting it in water.

....

3. The parasite doesn't kill its host.

....

[B] Write the scientific term for each of the following :

1. The material that get attracted to the magnet. (..................)
2. The light energy that can be seen. (..................)
3. The mixture results from the solubility of solids in liquid. (..................)
4. The change of light rays directions when they transmit through the separating surface between two different transparent media. (..................)
5. Any natural area including living organisms and non-living things. (..................)
6. A relation between two living organisms that benefit from each other. (..................)

25 South Sinai Governorate — Tur Sinai Educational Directorate

Answer the following questions :

1. [A] Complete the following :

(Saprophytism – iron – red – repel – mimicry – attract - copper – mutualism – camouflage – yellow)

1. From magnetic material .... and from non-magnetic material ....
2. .... and .... are from the ways of self-defence against predation in living organisms.
3. From primary coloured lights ...., and from secondary coloured lights ....
4. The like magnetic poles ...., but the dislike magnetic poles ....
5. The food relationship between nodular bacteria and bean ...., whereas the food relationship between fungi and dead bodies is ....

[B] What happens when ... ?

1. A magnet is hung to move freely.

....

2. Introducing rabbits into an island with much food and on natural enemies.

....

2. **[A] Write the scientific term for each of the following statements :**

1. The light that we can get by mixing two of the primary coloured light. (..................)
2. The temporary food relationship that end by devouring the prey or a part of it. (..................)
3. The regions of the magnet, where the magnetic force is most powerful. (..................)
4. A darkened area formed when light falls on an opaque object. (..................)

[B] Choose from column (A) what is suitable it from column (B) :

(A)	(B)
1. Glass prism	a. used to separate oil and water mixture.
2. Compass	b. change electric energy into magnetic energy.
3. Electromagnet	c. determine the main four directions.
4. Separating funnel	d. separating white light into seven spectrum colours.

1. .... 2. .... 3. .... 4. ....

3. **[A] Choose the correct answer :**

1. The relationship between sponge and tiny aquatic living organisms is ....
   a. parasitism. b. commensalism. c. predation.
2. From the examples of liquid mixture ....
   a. sand and water. b. lemon juice and water. c. sand and salt.
3. The result from solubility process is called ....
   a. solute. b. solvent. c. solution.
4. Light transmits in .... lines.
   a. straight b. curved c. broken
5. The speed of solubility increase by ....
   a. increase the amount of solvent.
   b. increasing the amount of solute.
   c. decreasing temperature.

PART 3

[B] Give reasons for :

1. Saprophytic organisms give great service to ecosystem.

....

....

2. The red apple seems black when you look at it through a green glass sheet.

....

....

4. [A] Put (✓) or (✗) :

1. Sun is the main source of the light on the Earth. (..................)
2. We can separate mixture of sand and water by filtration process. (..................)
3. Tiger is an example of extinct animals due to the change in natural conditions in the environment. (..................)
4. The electromagnet consists of copper coil only. (..................)
5. The banana fruit seems yellow as it reflect the green light colour. (..................)

[B] Compare between :

P.O.C	Filaria worm	Fleas
The diseases that cause :	....	....

1 Part

Unit One

Lesson 1

1
1. a. visible spectrum.
2. d. All the previous answers
3. c. straight
4. a. travelling of light in straight lines.
5. d. (a) and (b). 6. a. camera.
7. c. a shadow 8. b. smaller
9. c. semi-transparent materials.
10. d. Opaque 11. b. tissue paper.
12. a. frosted glass. 13. d. (a) and (b)
14. a. reflection
15. b. regular reflection.
16. c. irregular reflection.
17. b. irregularly 18. d. 40
19. b. 30 20. a. regularly
21. b. refraction 22. a. faster than
23. a. seven 24. c. glass prism.
25. b. orange and green colours.

2
(1) 1. d 2. b 3. a
(2) 1. d 2. f 3. c 4. a 5. b

3
1. (✓) 2. (✓) 3. (✓)
4. (✗) .... in straight lines. 5. (✓)
6. (✗) .... translucent materials.
7. (✗) Transparent materials ....
8. (✓) 9. (✓)
10. (✗) .... is an opaque material, ...
11. (✓) 12. (✓)
13. (✓) 14. (✓)
15. (✗) Reflection of light .... 16. (✓)
17. (✗) .... is reflected .... 18. (✓)
19. (✗) .... during rainfall. 20. (✓)
21. (✓)

4
1. The visible spectrum. 2. The Sun.
3. Shadow.
4. Transparent materials.
5. Transparent material.
6. Semi-transparent (Translucent) material.
7. Opaque material.
8. Opaque materials.
9. Opaque materials.
10. Opaque materials.
11. Light reflection.
12. Regular reflection.
13. Regular reflection.
14. Irregular reflection.
15. Irregular reflection.
16. Light refraction.
17. Rainbow.
18. The glass prism.
19. Spectrum colours.

5
1. The Sun
2. sound energy – electric energy – magnetic energy.
3. straight
4. Light reflection – light refraction – light travelling in straight lines
5. images – shadow
6. minimized – inverted. 7. Shadow
8. darkened – straight lines. 9. bigger
10. transparent – semi-transparent – opaque
11. transparent material.
12. transparent – translucent
13. transparent material.
14. Translucent – opaque
15. transparent – opaque
16. light reflection. 17. a smooth
18. Regular reflection – irregular reflection
19. Regular reflection
20. Irregular reflection
21. regular 22. irregular
23. 50
24. light refraction.
25. reflects – refracts 26. light refraction.
27. refracts.
28. seven – spectrum colours.
29. Rainbow 30. white
31. orange 32. red – violet
33. seven – glass prism.
34. Red – yellow – indigo

6
1. Because the moon light is the reflection of the sunlight that falls on the moon's surface.
2. Because it reflects the sunlight that falls on its surface.
3. Because light travels in straight lines.
4. Because light travels in straight lines.
5. Because they allow most light to pass through and objects can be seen clearly through them.
6. Because it allows some light to pass through and we cannot see objects clearly through it.
7. Because it doesn't allow light to pass through and objects cannot be seen through it.
8. Because transparent materials allow most light to pass through.
9. Because frosted glass is a translucent material which lets some light to pass through.
10. Because wood is an opaque material that doesn't allow light to pass through.
11. Due to the regular reflection of light.
12. Due to the refraction of light.
13. Due to the refraction of light.
14. Due to the refraction of light.
15. Because it consists of seven colours called spectrum colours.
16. Because the drops of water in air act as a glass prism which splits the sunlight into seven spectrum colours.

7
1. It is the light energy that can be seen.
2. It is the darkened area which is formed as a result of falling light on an opaque object.
3. It is the material which allows most light to pass through and objects can be seen clearly through it.
4. It is the material which allows some light to pass through and objects can be seen through it less clearly than through transparent one.
5. It is the material that doesn't allow light to travel through and objects can't be seen through it.
6. It is the bouncing (returning back) of light rays when light falls on a reflecting surface.
7. It is the reflection of light on a smooth and shiny reflected surface, where the light rays reflected directly in one direction.
8. It is the reflection of light on a rough reflected surface (which contains protrusions and tiny holes), where the light rays are reflected and scattered in different directions.
9. It is the change in the direction of light when it passes through a separating surface between two different transparent media, due to the change in the light speed.
10. It is the separation of white light into seven spectrum colours.

8
1. I can see the flame of the candle, because light travels in straight lines.
2. A clear shadow of the object is formed.
3. I can see the picture clearly.
4. I cannot see the picture clearly.
5. I can't see the picture.
6. I can see my image due to the reflection of light.
7. The spoon seems broken due to the refraction of light.
8. The white light is separated (splitted) into seven spectrum colours.
9. Rainbow is formed.

9
1.

Points of comparison	Transparent material	Translucent material	Opaque material
Definition :	It is the material which lets most light to pass through and objects can be seen clearly (with full details) through it.	It is the material which lets some light to pass through and objects can be seen through it less clearly.	It is the material that doesn't allow light to travel through and objects can't be seen through it.
Examples :	- The clear glass. - Air. - Clear water.	- Frosted glass. - Tissue paper.	- Rocks. - Foil paper. - Wood. - Carton.

2.

Points of comparison	Regular reflection	Irregular reflection
Definition :	It is the reflection of light on a smooth and shiny reflecting surface, where the light rays reflected directly in one direction.	It is the reflection of light on a rough reflecting surface, where the light rays reflected and scattered in different directions.
Example :	Light reflection on any smooth surface as mirror.	Light reflection on any rough surface as white paper (which contains protrusions and tiny holes).



Part 1

Answers of the Main Book

3.

Reflection of light	Refraction of light
It is the bouncing (returning back) of light rays when light falls on a reflecting surface.	It is the change in the direction of light rays when light passes through a separating surface between two different transparent media, due to the change in the light speed.

10
1. A minimized and inverted image for the candle flame is formed on the semi-transparent paper.
2. The formation of images through narrow holes is due to the travelling of light in straight lines.

11
1. reflection.
2. the irregular light reflection.
3. the regular light reflection.

12
1. light refraction 2. faster than
3. Due to the refraction of light.

13
1. white light – seven colours – a glass prism.
2. Red - Orange - Yellow - Green - Blue - Indigo - Violet.

Timss Questions

1. c. The lake water reflects the sunlight.
2. b. 40 cm.
3. c. irregular reflection.
4. b. Ⓑ

Lesson 2

1
1. c. red.
2. b. absorbs all light colours and allows the green colour only to pass through
3. b. the box absorbs all light colours and allows the orange colour only to pass through.
4. b. the transmitted light colour.
5. c. blue.
6. b. they reflect all light colours.
7. a. reflect all light colours.
8. a. absorbs all light colours
9. c. it absorbs all light colours and reflects the yellow colour only.
10. a. absorb all light colours and reflect their own colour only
11. d. black 12. a. yellow.
13. a. Cyan. 14. b. cyan
15. d. the white light. 16. a. Red and green.

2
1. (✓)
2. (✗) .... , the rose absorbs all light colours and reflects the red colour only.
3. (✗) .... , because it absorbs all light colours and allows its own colour only to pass through.
4. (✓)
5. (✗) .... absorbs ....
6. (✓)
7. (✗) The coloured opaque objects ....
8. (✗) The green table absorbs all light colours and reflects the green colour only.
9. (✓)
10. (✗) .... is red. 11. (✓)
12. (✗) .... the cyan light.
13. (✗) .... are secondary coloured lights.
14. (✓)
15. (✗) One of the secondary coloured ....

3
1. The white light.
2. The coloured transparent or translucent object.
3. Primary coloured lights.
4. The white opaque objects.
5. The black opaque objects.
6. The coloured opaque object.
7. The coloured opaque objects.
8. Secondary coloured light.
9. The white light. 10. Magenta.
11. Cyan. 12. Blue and green lights.

4
1. seven spectrum colours. 2. white light
3. all light colours – the blue colour
4. Transparent and translucent
5. its own colour only
6. the yellow colour. 7. the violet
8. reflected 9. reflects – absorbs
10. Opaque 11. red
12. opaque – transparent – translucent
13. Black opaque – coloured opaque
14. red – black
15. all light – the green colour.
16. red 17. white light.
18. Red – green – blue
19. Primary coloured lights
20. the white light.
21. Yellow – magenta – cyan
22. Secondary coloured lights
23. red – green 24. cyan light.
25. red – blue

5
1. Because it is a transparent object, where it absorbs all light colours and allows the green colour only to pass through.
2. Because the transparent and semi-transparent bodies absorb all light colours and permit their own colours only to pass through.
3. Because the banana fruit is a coloured opaque object that absorbs all light colours and reflects the yellow colour only.
4. Because white clothes reflect all light colours that fall on them causing the decrease of feeling of heat.
5. Because it absorbs all light colours and allows the red colour only to pass through.
6. Because white objects reflect all light colours that combine together forming white light.
7. Because black clothes absorb all light colours that fall on them causing the feeling of warmth.
8. Because the transparent coloured object absorbs all light colours and allows its own colour only to transmit through.
9. Because the red apple reflects the red colour which is absorbed by the green glass sheet and doesn't transmit through it, so the apple seems black.
10. Because they can't be produced by mixing two of the other coloured lights.
11. Because they are produced by mixing two of the primary coloured lights.
12. Because the white opaque objects (chalk) reflect all light colours, while the black opaque objects (board) absorb all light colours.
13. Because it is produced by mixing red colour with blue colour which are primary coloured lights.

6
1. A white light is formed.
2. The black object absorbs the green colour and appears black.
3. The red apple absorbs all light colours and reflects the red colour only.
4. The bottle absorbs all light colours and allows the yellow colour only to transmit through.
5. The apple seems black.
6. Cyan light is produced.
7. The ball reflects all light colours and appears as white.
8. The banana fruit absorbs all light colours and reflects the yellow colour only.
9. Magenta light is produced.
10. Yellow light is produced.

7
1. They are coloured lights which impossible to be produced by mixing two of the other coloured lights.
2. They are coloured lights that produced by mixing two of the primary coloured lights.

8

Points of comparison	Primary coloured lights	Secondary coloured lights
1. Definition :	They are coloured lights which impossible to be produced by mixing two of the other coloured lights.	They are coloured lights that are produced by mixing two of the primary coloured lights.
2. Examples :	Red, blue and green.	Magenta , cyan and yellow.

9
① Cyan (Secondary colour).
② Green (Primary colour).
③ Yellow (Secondary colour).
④ Red (Primary colour).
⑤ Magenta (Secondary colour).

10
a. Black. b. White.
c. Opaque violet.
d. Transparent blue.



11

The colour of object	The colour of Falling light	The colour of object after falling light	Reason
1. Black.	White.	Black.	Because black opaque object absorbs all light colours.
2. Green opaque.	White.	Green.	Because coloured opaque object absorbs all light colours and reflects its own colour only.
3. Yellow opaque.	White.	Yellow.	Because coloured opaque object absorbs all light colours and reflects its own colour only.
4. Black.	Red.	Black.	Because black opaque object absorbs all light colours.
5. Transparent orange.	White.	Orange.	Because transparent coloured object absorbs all light colours and allows its own colour to transmit through.

Timss Questions

1.

Colour light	Colour of filter	Colour of light that passes through the filter
a. Blue.	- Transparent red	- No Colour.
b. Green.	- Transparent green	- Green.

2. It appears black.
3. a. black. b. red.
4. They must wear white clothes in summer season to reflect all light colours, but they wear black clothes in winter to absorb all light colours giving them the feeling of warmth.

Lesson 3

1
1. a. 2000 2. a. magnetite.
3. b. two 4. d. chalk.
5. d. nickel. 6. b. attract it.
7. b. two 8. b. repel
9. a. attract 10. b. at its two poles.
11. b. more than three 12. a. north
13. c. north-south 14. b. attract.
15. a. repel. 16. d. magnetic field.
17. c. Magnetic force 18. d. its middle.
19. c. small and light magnetic needle.
20. b. main four directions.
21. c. north-south

2
(1) 1. d 2. b 3. e 4. a 5. c
(2) 1. c 2. d 3. e 4. a 5. b

3
1. (✓)
2. (✗) .... attracts the magnetic materials only.
3. (✗) .... are called magnetic materials.
4. (✓)
5. (✗) ...., paper and wood
6. (✗) Nickel ....
7. (✗) .... two poles.
8. (✓) 9. (✓)
10. (✗) .... the magnetic poles.
11. (✓) 12. (✓)
13. (✓) 14. (✓)
15. (✗) The compass ....
16. (✗) .... points to the south direction of ....
17. (✗) The magnetic force ....
18. (✗) .... at the two magnetic poles.
19. (✗) .... an invisible force.

4
1. The natural magnet.
2. Magnetic materials.
3. Non-magnetic materials.
4. The magnetic poles.
5. The north pole.
6. The south pole. 7. The magnetic field.
8. The south pole. 9. Magnetic force.
10. The magnetic compass.
11. The magnetic compass.
12. Magnetic force.

5
1. Magnesia – iron. 2. black
3. the natural magnet – the artificial magnet.
4. iron – magnetite.
5. Horse-shoe magnet – bar magnet
6. magnetic materials – non-magnetic materials
7. non-magnetic materials.
8. magnetic – copper
9. two – the north pole – the south pole.
10. the north pole. 11. two poles.
12. north-south 13. repel – attract
14. the two poles 15. magnetic field
16. Magnetic force
17. William Gelbert – the magnetic compass.
18. magnetic compass
19. main four geographical directions.
20. the magnetic compass
21. north – south

6
1. Because they are attracted to the magnet.
2. Because it is not attracted to the magnet.
3. Because nickel is a magnetic material, while aluminium is a non-magnetic material.
4. Because they are not attracted to the magnet.
5. Because they are attracted to the magnet.
6. Because one of the two poles always points to the north pole of the Earth, but the other points to the south pole of the Earth.
7. Because the like (similar) magnetic poles repel each other, while the dislike (different) magnetic poles attract each other.
8. Because the magnetic force is concentrated at the two poles of the magnet.
9. Because its north pole refers to the north direction of the Earth and its south pole refers to the south direction of the Earth.
10. To avoid the attraction between the magnetic needle and the iron box of the compass.

7
1. The piece of nickel is attracted to the magnet.
2. The piece of wood is not attracted to the magnet.
3. The iron nails are not attracted to the middle of the magnet.
4. The biggest amount of iron filings is attracted to the two poles of the magnet and this amount decreases gradually until it disappears at the middle of the magnet.

5. The magnet attracts the iron pins and cobalt only as they are magnetic substances.
6. It takes a fixed direction which is north-south direction.
7. The two poles repel each other.
8. The two poles attract each other.
9. The iron filings arranged around the magnet in a regular way and assembled at the two poles of the magnet.
10. The north pole of the needle always points to the north pole of the Earth and its south pole always points to the south pole of the Earth.

8

Magnetic materials	Non-magnetic materials
- Steel paper clips. - Cobalt. - Iron filings. - Iron.	- Chalk. - Copper. - Plastic. - Aluminium.

9
1. They are the materials which are attracted to the magnet.
2. They are the materials which are not attracted to the magnet.
3. The regions of magnet at which most of the magnetic materials are attracted.
4. It is the space around the magnet in which, the effect of magnetic force appears.
5. It is the ability of the magnet to attract the magnetic materials existed in its field.

10

Points of comparison	Magnetic materials	Non-magnetic materials
Definition:	They are the materials which are attracted to the magnet.	They are the materials which are not attracted to the magnet.
Examples:	Iron – steel – cobalt – nickel.	Chalk – glass – paper – aluminium – copper – wood.

11 The properties of the magnet are:
1. The magnet has two poles.
2. The freely moving magnet always takes a fixed direction which is north-south direction.



3. The like (similar) magnetic poles repel each other, but the dislike (opposite) magnetic poles attract each other.
4. The magnet is surrounded by an area called magnetic field.

12
1. attract 2. repel
3. similar magnetic – different magnetic

13
a. The magnetic compass.
b. a small and light magnet that can spin freely around a fixed axis.
c. It is used to identify the main four geographical directions.

Timss Questions

1
1. attracted – magnetism is concentrated at the two poles of the magnet.
2. is not attracted – magnetism disappears at the middle of the magnet.

2 (a) No.
(b) Because magnet Ⓐ attracts the pin from 15 cm. while magnet Ⓑ attracts the pin from 10 cm., Thus magnet Ⓐ is stronger.

3 c. noth or south pole no difference.

4 b. Magnet Ⓑ.

Lesson 4

1
1. b. the compass needle deflects.
2. c. electromagnet. 3. b. compass.
4. d. electric energy into magnetic energy.
5. b. wrought iron. 6. d. (a) , (b) and (c).
7. d. (a) and (b)
8. c. cutting the electric current.
9. d. both (a) and (b).
10. d. refrigerator. 11. a. temporary
12. c. bar magnet
13. a. kinetic energy into electric energy.
14. b. copper 15. b. Faraday
16. c. tire. 17. d. (b) and (c).
18. d. both (a) and (c). 19. d. (a) and (c).

2
1. (✗) .... of a wrought iron bar, coil and a battery.
2. (✗) .... changes electric energy into magnetic energy.
3. (✓) 4. (✓)
5. (✗) .... passes through a coil winding around a wrought iron bar.
6. (✗) .... by increasing the electric current intensity.
7. (✓) 8. (✓) 9. (✓)
10. (✗) Faraday .... kinetic energy can ....
11. (✗) .... kinetic energy into electric energy.
12. (✓) 13. (✓)
14. (✗) Small dynamo ....
15. (✗) .... strong magnets.
16. (✓)
17. (✗) .... and magnetism can be produced ....

3
1. The electromagnet.
2. The electromagnet.
3. The magnetic compass.
4. The electromagnet.
5. Wrought iron.
6. The electromagnet. 7. Faraday.
8. The electromagnet. 9. The dynamo.
10. The small dynamo.
11. The huge dynamo.
12. The electric generator (the dynamo).
13. The huge dynamo.
14. The huge dynamo. 15. Ammeter.

4
1. a magnetic 2. deflects.
3. the electromagnet. 4. increases
5. electromagnet.
6. the electric current
7. a copper wire – a bar of wrought iron – a battery.
8. electric – magnetic
9. cutting the electric current.
10. The electromagnet 11. an electric
12. Faraday
13. an electric current
14. the kinetic – electric
15. an electric current.
16. a copper coil – a magnet.
17. The small dynamo in the bicycle – huge electric generator
18. using a strong magnet – increasing the number of turns in the moving coil.
19. the dynamo.
20. lightening cities – operating factories.
21. electric power

5
1. Because the electric current changes wrought iron nail into a temporary magnet that is called an electromagnet.
2. Because the electric current has a magnetic effect , where it generates a magnetic field.
3. Because by cutting the electric current, the electromagnet loses its magnetic force.
4. Because the battery is the source of the electric current.
5. Because it is used in factories to lift the heavy iron or steel blocks and it is used in making many appliances as electric bell, electric mixer, disc drive and television.
6. Because the electromagnet losses its magnetism when cutting the flow of the electric current.
7. Because by moving the bicycle's tire, the cylinder moves and the magnet that connected with the cylinder moves , so the electric current is generated in the coil causing lightening of the lamp.
8. Due to passing the electric current through the copper wire.
9. Due to generation of more electric current in the copper wire.
10. To generate large amount of electricity used for lightening cities and operating factories.
11. Because by moving the magnet in the coil, an electric current is generated.
12. To increase the produced amount of electricity.

6
1. The iron bar becomes a temporary magnet called the electromagent .
2. The iron nail attracts iron filings as it becomes an electromagent.
3. The electromanget loses its magnetic force and iron blockes fall down.
4. The lamp lights due to the generation of an electrical energy.
5. The mechanical energy changes into electrical energy.
6. It causes increasing of electric current that is generated from dynamo.

7

Points of comparison	Electromagnet	Dynamo
Scientific idea:	It changes the electric energy into magnetic energy.	It changes the kinetic energy into electric energy.
Structure:	A twisted copper wire coiling around a bar of wrought iron and this wire connected to a battery.	A copper coil and a magnet.

8
1. By increasing:
   - The number of coil turns.
   - The number of batteries, where the intensity of the electric current passing through the coil increases.
2. • By using a strong magnet.
   - By increasing the number of turns in the moving coils.

9 It consists of:
- A small cylinder that touches the bicycle wheel tire.
- This small cylinder is connected with a U-shaped (horse-shoe) magnet that is surrounded by a coil of wire.

10
1. (a) Wrought iron nail.
   (b) Copper wire. (c) Battery.
2. the electromagnet.
3. It is used in :
   - Factories to lift the heavy iron blocks as it used in making big-sized winches.
   - Making many appliances as the electric mixer, disc drive and electric bell.
4. The part (a) loses its magnetism.

11 It is the device that converts the electric energy into magnetic energy.

12
1. It is used in factories to move the heavy iron blocks as it is used for making big-sized winches.
2. It is used in electric power stations to generate a large amount of electricity used for lightening cities and operating factories.
3. They used to lift the heavy iron blocks.



13 1. The compass needle doesn't deflect in the four positions.
2. The compass needle deflects in the four positions.
3. The electric current has a magnetic effect.

14 1. a magnet – a coil. 2. an electric current
3. the kinetic – electric 4. dynamo.

Timss Questions

1 1. Part (b) and part (c).

2 a. Wind the copper wire around the soft iron nail after removing the insulated material from the two ends.
b. Connect the two ends of the wire to the two poles of the battery to form an electric circuit.
c. When she approach the soft iron nail to the sample of iron nails and paper clips, she find that the soft iron nail attracts them as it becomes an electromagnet.

3 a. doesn't deflect. b. deflects.
c. increases due to passing more electric current.

4

The small dynamo in a bicycle	The huge dynamo in an electric power stations
It generates a small amount of electricity used to lighten the bicycle's bulb.	It generates a large amount of electricity used for lightening cities and operating factories.

Unit TWO

Lesson 1

1 1. b. mineral water.
2. c. mixture.
3. c. Salty solution, sugary solution and mineral water
4. d. sugar.
5. a. its components can't be separated easily.
6. b. mixtures.
7. a. a mixture of some minerals and water.
8. d. solid-solid mixtures.
9. a. a gaseous-gaseous mixture.
10. a. solid-liquid mixture.
11. a. A mixture of vinegar and water
12. d. filtration.
13. a. shaking. 14. a. filtration process.
15. d. All the previous answers
16. a. a magnet. 17. c. salty solution.
18. b. dissolving, filtration and evaporation processes.
19. d. shaking process.
20. c. a separating funnel.
21. c. the evaporation process.

2 (1) 1. b 2. c 3. a 4. e 5. f
(2) 1. c 2. a 3. d 4. e 5. b
(3) 1. b 2. c 3. a 4. e 5. d

3 1. (✗) Mineral water is a mixture, while distilled water is a pure substance.
2. (✗) .... are pure substances.
3. (✗) Pure substance is ....
4. (✗) You can't see ....
5. (✗) Calcium and magnesium ....
6. (✗) Mixtures are separated by ....
7. (✗) .... is a pure substance, while sugar solution is a mixture.
8. (✓) 9. (✓) 10. (✓) 11. (✓)
12. (✓) 13. (✓) 14. (✓)
15. (✗) .... by filtration process.
16. (✗) Separating funnel is ....
17. (✗) .... or shaking.
18. (✗) Magnetic attraction, filtration ....
19. (✗) .... that has an insoluble ....
20. (✓)
21. (✗) .... filtration process ....

4 1. Pure substances. 2. Mixtures.
3. Mixtures.
4. Grinding or shaking.
5. Atmospheric air.
6. Soda water. 7. Solid-liquid mixture.
8. Mineral water. 9. Stirring.
10. Evaporation process.
11. Mixture.
12. Evaporation process.
13. Filtration process.
14. Evaporation process.
15. A magnet. 16. Separating funnel.
17. Magnetic attraction.

5 1. pure substances – mixtures.
2. pure substance – mixture
3. mixtures.
4. mixtures – pure substances. 5. mixture.
6. Solid-solid – gaseous-liquid – liquid-liquid
7. liquid-liquid – solid-liquid
8. carbon dioxide – oxygen
9. mixture – calcium
10. gaseous-gaseous – gaseous-liquid
11. mixture
12. don't react
13. stirring – shaking
14. shaking – grinding.
15. stirring – shaking.
16. Shaking – grinding
17. shaking – stirring.
18. filtration – magnetic attraction
19. a magnet.
20. a magnet. 21. Filtration
22. Evaporation
23. Separating funnel 24. Filtration
25. Separating funnel – filtration – evaporation

6 1. Because each of them consists of only one type of identical particles.
2. Because each of them consists of more than one type of particles.
3. Because air consists of more than one type of particles such as oxygen gas, nitrogen gas, carbon dioxide gas and water vapour.
4. Because mineral water consists of more than one type of particles such as water, calcium and magnesium.
5. Because liquid materials can be mixed to form liquid-liquid mixtures by shaking or stirring.
6. Because filtration process is used to separate the solid materials as sand that are insoluble in water.
7. Because magnet attracts the iron filings and separates them from the mixture.
8. Because by usnig a magnet, iron filings are attracted to the magnet and separated from sand.
9. Because salt dissolves in water forming salty solution, while sand doesn't dissolve in water.
10. Because sand is an insoluble material in water.
11. Because the iron filings-sand mixture is separated by the magnetic attraction, but sand-water mixture is separated by filtration process.
12. Because the separating funnel is used to separate liquid mixtures as water-oil mixture whose components don't mix together.

7 1. A sugar solution is formed.
2. At first, they seem to be mixed, but with time the sand precipitates in the bottom of the cup.
3. Oil doesn't mix with water and form a layer over it.
4. Water evaporates, leaving the salt in the cup.
5. A mixture of salt-pepper is formed.
6. A mixture of soda water (gaseous-liquid mixture) is formed.
7. The magnet attracts the steel paper clips, leaving the sand.
8. Water evaporates and table salt can be collected.
9. A liquid-liquid mixture of juices is formed.

8 1. It is used to separate the solid materials that are insoluble in water.
2. It can be used to separate the solid materials which are soluble in water.
3. It is one of the methods of forming solid-solid mixtures.
4. It can be used to separate magnetic substances as iron from other solid substances in a mixture.
5. It can be used to separate the heterogeneous liquid mixtures (as oil-water mixture).

6. It is one of the methods of forming solid-liquid and liquid-liquid mixtures.

9
1. By heating (evaporation) process where, water evaporates leaving salt.
2. By using a magnet where, magnet attracts iron filings leaving sand.
3. By using the separating funnel.
4. By using filter paper which separates sand and lets water pass.
5. By using a magnet which attracts steel paper clips leaving flour.
6. By using filter paper which separates chalk and lets water pass.
7. By using filter paper which separates coffee and lets water pass.
8. By using filter paper which separates mud and lets water pass.

10
1. It is a substance that consists of only one type of identical particles.
2. It is a substance that consists of more than on type of particles.

11
1. Filtration process is used to separate the solid materials that are insoluble in water such as sand-water mixture.
2. Evaporation process is used to separate the solid materials which are soluble in water such as salty solution.

12 Methods of separation of mixtures are:
1. **Magnetic attraction :** It is used to separate magnetic substances as iron from other solid substances in a solid-solid mixtures.
2. **Evaporation process :** It is used to separate solids that dissolve in liquids in a solid-liquid mixtures.
3. **Filtration process :** It is used to separate solids that insoluble in liquids in a solid-liquid mixtures.
4. **Separating funnel :** It is used to separate liquid mixtures whose components don't mix together such as water-oil mixture.

13

Solid-solid mixture	Solid-liquid mixture	Liquid-liquid mixture
• Sand & iron filings. • Sand & salt. • Iron filings & flour.	• Salty solution. • Mineral water. • Sugary solution.	• Oil & Water. • Vinegar & Water.

14
1. The separating funnel.
2. Because by its tap, we can separate two different liquids that don't mix together.
3. Water-oil mixture.

15 (2) Stirring ⟶ (1) Filtration ⟶ (3) Evaporation.

16
1. Solid-solid mixture.
2. No.

17
1. Sand-iron filing mixture.
2. Magnetic attraction-because magnet attracts the iron filings and separates them from the mixture.

18

Points of comparison	Pure substance	Mixture
Definition :	It is the substance that is made of only one type of identical particles.	It is the substance that consists of more than one type of particles.
Examples :	Distilled water-sugar-baking soda.	Concrete - tomato sauce - mineral water.

Timss Questions

1 1.

Example	Its type	Another example
• Fruit salad	Solid-solid mixture.	Vegetable salad.
• Air	Gaseous -gaseous mixture.	Nitrogen - oxygen mixture.
• Soda water	Gaseous - liquid mixture.	Oxygen-water mixture.
• Sugar in water	Solid-liquid mixture.	Salt in water.
• Oil in water	Liquid-liquid mixture.	Vinegar in water.

2
• liquid-liquid
• By using a separating funnel, where vinegar falls down from the separating funnel, but oil remains inside the separating funnel.

3 c. Use a magnet.

4 c. add water, filter out the papper and boil off the water to get the salt.

Lesson 2

1
1. a. a homogeneous liquid mixture.
2. d. (a) or (b). 3. d. (a) or (c).
4. b. orange juice.
5. c. a solute and a solvent.
6. a. homogeneous 7. c. stirring.
8. b. solvent. 9. b. chocolate.
10. c. solute. 11. b. salt.
12. d. Solution
13. d. all the previous answers.
14. d. all the previous answers.
15. b. colour of solvent.
16. a. Water 17. a. decreases.
18. a. increases the speed of solubility.
19. c. solubility process depends on the kind of solute.
20. b. decrease in the solubility time.

2
1. (✗) .... is a homogeneous liquid mixture.
2. (✓)
3. (✗) .... is the solvent.
4. (✓)
5. (✗) .... is the solute ....
6. (✗) .... forms a heterogeneous mixture.
7. (✓)
8. (✓)
9. (✗) .... the solubility time decreases.
10. (✓)
11. (✓)
12. (✗) Solubility speed increases ....
13. (✓) 14. (✓)
15. (✗) .... is a solution .... is a suspension.
16. (✗) .... is shorter than ....
17. (✗) .... insoluble in that solvent.

3
1. Solvent. 2. Solute.
3. Solvent. 4. Solution.
5. Suspension. 6. Solution.
7. Homogeneous mixture.
8. Heterogeneous mixture.
9. Solvent. 10. Solution.
11. Solubility process.
12. Solubility process.

4
1. homogeneous – heterogeneous mixtures.
2. a homogeneous liquid mixtures.
3. The solution
4. Homogeneous mixture
5. heterogeneous – homogeneous
6. suspensions.
7. Apple juice – tea – sugary solution
8. mud in water
9. a solute – a solvent – solubility
10. a solute. 11. the solvent.
12. solubility process.
13. Solute – Solvent – Solubility process
14. solute – solvent.
15. Water
16. quantity of solvent and solute – temperature.
17. suspension – filtration process.
18. heterogeneous mixture suspension
19. Suspension
20. decreases
21. the temperature
22. decreases 23.shorter 24.increases
25. differs from
26. heating – stirring – increasing the amount of solvent.

5
1. Because it consists of more than one type of particles.
2. Because some solid substances are soluble forming homogeneous mixtures (solutions), while others are insoluble forming heterogeneous mixtures (suspensions).
3. Because the components of each of them can't be distinguished from each other.
4. Because the particles of mud can be distinguished from water.
5. Because thousands of solid materials dissolve in it.
6. Because it is the solid substance that dissolves in milk which is the solvent.
7. Because when the temperature of the solution increases, the solubility speed increases.



8. Because the solubility time depends on the kind of solute.
9. Because when the amount of the solute increases, the solubility time increases.
10. Because when the temperature increases, the solubility speed increases.
11. Because when the temperature increases, the solubility speed increases.
12. Because grinding the solid materials increases the speed of their solubility.
13. Because by increasing the temperature and stirring, the solubility process becomes faster (solubility time decreases).
14. Because when the amount of solvent increases, the solubility time decreases.

6
1. Dissolving in hot water is faster than in cold water.
   - Because by increasing the temperature, the solubility time decreases.
2. Dissolving with stirring is faster than that without stirring.
   - Because stirring decreases the solubility time.
3. Dissolving salt in 300 ml. of water is faster than that in 100 ml. of water.
   - Because the increasing in the amount of solvent decreases the solubility time.
4. Dissolving of grinded solids before adding them to a liquid is faster than breaking them down into small pieces.
   - Because grinding the solid materials increases the speed of their solubility.
5. Dissolving of sugar grains is faster than sugar cubes in water.
   - Because grinding of solid materials increases the speed of their solubility.

7
1. A heterogeneous mixture (suspension) is formed.
2. The solubility time decreases.
3. The solubility time increases.
4. The solubility time increases.
5. The solubility time decreases.
6. The solubility time of sugar in the beaker that has a large amount of water is less than that has small amount of water.

8
1. It is a homogeneous mixture in which the solute breaks down into its most basic particles that spread throughout the solvent.
2. It is the substance that dissolves in a solvent.
3. It is the substance in which the solute dissolves.
4. It is the process by which a solute dissolves in a solvent leading to the disappearance of the solute.
5. It is the mixture in which its components can't be distinguished from each other.
6. It is the mixture in which its components can be distinguished from each other.
7. It is a heterogeneous mixture in which some particles of the solute are suspended throughout the solvent.

9

1.

Points of comparison	Mixture	Solution
Definition :	It is the substance that consists of more than one type of particles.	It is a type of mixtures that consists of a solute and a solvent.
Example :	Fruit salad.	Sugary solution.

2.

Points of comparison	The solute	The solvent
Definition :	It is the substancethat dissolves ina liquid substance (solvent).	It is the liquid substance in which the solute dissolves.
Example :	Salt in salty solution.	Water in salty solution.

3.

Points of comparison	The homogeneous mixture	The heterogeneous mixture
Definition :	It is the mixture in which its components can't be distinguished from each other.	It is the mixture in which its components can be distinguished from each other.
Example :	Salty solution.	Mud in water.

4.

Points of comparison	The solution	The suspension
Definition :	It is a homogeneous mixture in which the solute breaks down into its most basic that spread throughout the solvent.	It is a heterogeneous mixture in which some particles of the solute are suspended throughout the solvent.
Example :	Salty solution.	Mud in water.

5.

Points of comparison	A soluble substance	An insoluble substance
Definition :	• It is the substance that dissolves (disappears) in a slovent. • The formed homogeneous mixture is called solution.	• It is the substance that does not dissolve (suspends) in a solvent. • The formed heterogeneous mixture is called suspension.
Example :	Salt in salty solution.	Mud in water.

10 By increasing the temperature of the solution, the time of the solubility process decreases.

11 **Factors affecting the solubility process are :**
1. Quantity of solvent and solute.
2. Temperature.
3. Stirring or shaking.
4. The kind of the solute.
5. Grinding the solid materials.

12

	Solute	Solvent
1.	Sugar.	Tea solution.
2.	Sugar.	Lemon juice.
3.	Baking soda.	Water.
4.	Sodium carbonate.	Water.
5.	Salt.	Water.

13
1. a. Salt in fig. (b) takes a shorter time to dissolve than in fig. (a).
   b. Increasing the temperature decreases the solubility time.
2. a. Dissolving sugar in fig. (a) takes a shorter time than that needed to dissolve the same quantity in fig. (b).
   b. Solubility process depends on the amount of solvent, where by increasing the quantity of solvent, the solubility increases and vice versa.
3. a. Dissolving sugar in fig. (b) takes a shorter time than in fig. (a).
   b. Solubility process depends on the amount of solute, where decreasing the quantity of solute, the solubility increases and vice versa.

14
1. Beaker in fig. (a) contains sodium chloride solution, and beaker in fig. (b) contains sodium carbonate solution.
2. The solubility process depends on the kind of the solute.

Timss Questions

1
A. Solubility process.
B. increases.
C. decreases.
D. d. (a) and (b)

2
a. Sodium chloride solution.
b. Sodium chloride solution.

3

Oil	Sand	Alcohol	Sodium chloride
Cheese	Vinegar	Chocolate	Benzene
Water	Wax	Milk	Apple juice

Unit THREE

Lesson 1

1
1. a. producer organism.
2. d. predator. 3. c. prey.
4. b. temporary 5. b. autotrophic
6. c. Drosera 7. a. predator.
8. d. chameleon 9. b. cuttlefish
10. a. frog 11. d. (a) and (b)
12. a. Mimicry 13. b. Mutualism
14. c. mutualism. 15. d. nitrogen
16. b. Commensalism
17. c. host. 18. b. loss
19. b. parasites. 20. b. fish.
21. d. liver worm. 22. a. lamprey.
23. b. filaria 24. c. malaria
25. a. Saprophytism
26. c. decomposer organisms.

2
1. (✓)
2. (✗) .... predation, saprophytism and symbiosis.
3. (✗) The predation ....
4. (✓) 5. (✓) 6. (✓)
7. (✗) In camouflage .....
8. (✓) 9. (✗) In mimicry .....
10. (✓)
11. (✗) .... is known as mutualism.
12. (✗) Mutualism is ....
13. (✗) Commensalism is ....
14. (✗) Parasitism ....
15. (✓)
16. (✗) External ....
17. (✗) .... are internal parasites.
18. (✓)
19. (✗) Filaria worms ....
20. (✓) 21. (✓)
22. (✗) .... which gets its food by decomposing food remains or bodies of dead organisms.
23. (✓)

3
1. The food.
2. Green plants (autotrophic organisms).
3. Predation. 4. Predation.
5. The predator. 6. The prey.
7. Insectivorous plants. 8. Predation.
9. Camouflage.
10. Cuttlefish (sepia). 11. Mimicry.
12. Mutualism. 13. Mutualism.
14. Nodular bacteria. 15. Commensalism.
16. Commensalism. 17. Parasitism.
18. Parasite. 19. The host.
20. Parasitism.
21. External parasite. 22. Filaria worm.
23. Mosquito. 24. Fleas.
25. Bilharzia worm. 26. Anaemia.
27. Saprophytism.
28. Bread mold fungus. 29. Saprophytes.

4
1. Producers autotrophic
2. saprophytism – symbiosis.
3. predator – prey. 4. predation.
5. tiger – wolf 6. plant – animal
7. insectivorous – drosera – dionaea.
8. protein. 9. predation
10. Camouflage – mimicry
11. mutualism, commensalism and parasitism.
12. camouflage 13. camouflage.
14. mimicry – camouflage
15. hide from its enemies.
16. mutualism. 17. mutualism.
18. commensalism. 19. food – shelter
20. the parasite – the host.
21. host – parasite.
22. external parasitism – internal parasitism.
23. the host's body – internal parasite
24. mosquito-bilharzia worm
25. their digested food – cells and tissues.
26. the host – the prey. 27. Filaria
28. small pox – anaemia 29. parasite.
30. food remains – dead organisms.
31. saprophytic
32. Bread mold fungus – mushroom
33. penecillium 34. saprophytism.

5
1. Because they make their own food during photosynthesis process.
2. Because lions feed on animals (as deers) which feed on green plants.

3. Because it ends up by devouring the prey or a part of it.
4. Because plants are autotrophic organisms that can make their own food by photosynthesis process.
5. Because these plants cannot absorb some compounds from the soil to make protein.
6. Because these plants prey some insects to get their required elements for making protein.
7. Because wolf feeds on rabbit.
8. To protect themselves from enemies by changing their colour to simulate the colours of their surrounding environment.
9. Because cuttlefish ejects a black fluid in water when attacked by enemies to hide from them.
10. To hide from its enemies.
11. To hide from its enemies.
12. To hide from its enemies.
13. To fear their enemies and escape from them by mimicry phenomenon.
14. To fear their enemies and escape from them by minicry phenomenon.
15. Because nodular bacteria provides the leguminous plants with nitrogen in an inorganic form, while the leguminous plants provide the bacteria with sugar.
16. Because tiny aquatic living organisms get food and shelter from the canals and fissures found in the sponge, while the sponge neither gets benefit nor is harmed from these living organisms.
17. Because the parasite depends completely on the host to get its food and causes weakness to the host, but doesn't kill it as the predator does with its prey.
18. Because the parasite will lose its source of food and shelter.
19. Because the parasite depends completely on the host to get its food.
20. Because they live externally on the host's body and feed by sucking its blood.
21. Because they live internally inside the host's body sharing the host its digested food or feed on its tissues and cells.
22. Because the parasite depends completely on the host to get its food causing weakness to the host.
23. Because they get their food by decomposing food remains or bodies of dead organisms.
24. To get their food.
25. Because they get their food by decomposing food remains or bodies of dead organisms.

6
1. Death of all organisms.
2. It simulates the colours of its surrounding environment.
3. It ejects a black fluid in the surrounding water.
4. The leguminous plants cannot get nitrogen in an inorganic form.
5. It susks the blood of the host and may convey diseases to the host.
6. A dark green layer is formed on the bread, so the bread changes into rotten bread.

7
1. Oxygen. 2. Rat.
3. Drosera. 4. Fleas.

8
1. Predation. 2. Predation.
3. Predation. 4. Mutualism.
5. Commensalism.
6. Saprophytism. 7. Saprophytism.
8. External parasitism.
9. External parasitism.
10. Internal parasitism.
11. Internal parasitism.

9
They fix nitrogen in an inorganic form to provide the plant with it.

10
1. Predation.
2. To get its required elements for making protein.

11
1. It is a food relationship among living organisms, where one living organism devours another one.
2. It is the phenomenon in which the living organism protects itself from enemies by changing its colour to simulate the colours of its surrounding environment.

3. It is the phenomenon in which the harmless living organism imitates other harmful or poisonous living organism to fear its enemies and escape from them.
4. It is a food relationship in which each organism gets benefit from the other.
5. It is a food relationship between two living organisms, where one of them benefits from the other, while the other neither gets benefit (in the form of food) nor is harmed.
6. It is a food relationship between two different kinds of living organisms, where one of them benefits from the other and is known as the parasite , while the other is harmed and is known as the host.
7. It is a food relationship in which saprophytes get their food by decomposing food remains or bodies of dead organisms.

12
1. Filaria worm. 2. Mosquitoes.
3. Fleas. 4. Bilharzia worm.
5. Ascaris worm.

13

Predators	Parasites	Decomposers
- Lion. - Snake.	- Ascaris worm. - Lice. - Jawless lamprey.	- Bread mold fungus.

14 1.

Points of comparison	Commensalism	Parasitism
Definition:	It is a food relationship between two living organims .where one of them benefits from the other, while the other neither gets benefit nor is harmed.	It is a food relationship between two different kinds of living organisms where , one of them benefits from the other and is known as the parasite, while the other is harmed and is known as the host.
Example:	The relation between sponge and tiny aquatic living organisms.	The relation between tape worms and man.

2.

Points of comparison	Parasitism	Saprophytism
Definition:	It is a food relationship between two different kinds of living organisms , where one of them benefits from the other and is known as the parasite, while the other is harmed and is known as the host.	It is a food relationship in which saprophytes get their food by decomposing food remains or bodies of dead organisms.
Example:	The relation between ascaris worms and man.	The relation between bread mold fungus and bread.

3.

Points of comparison	External parasitism	Internal parasitism
The place, where the parasite lives:	The parasite lives externally on the host's body.	The parasite lives internally inside the host's body.
The food of the parasite:	The parasite feeds by sucking the blood of the host.	The parasite shares the host its digested food or feeds on its cells and tissues.
Examples:	- Mosquitoes. - Lice. - Fleas. - Ticks.	- Liver worms. - Tape worms. - Filaria worms. - Bilharzia worms.

15
(1) 1. c 2. b 3. d 4. e 5. a
(2) 1. c 2. a 3. e 4. b 5. d

16
1. Predation. 2. External parasitism.
3. Saprophytism. 4. Predation.

Timss Questions

1
a. Camouflage – (C).
b. Predation – (D).
c. (B) – stripes – mimicry.
d. (A)

2

Parasites convey diseases to the host	Parasites shares the host its digested food
Lice.	Liver worms
Fleas.	Bilharzia worms.
Mosquitoes.	Filaria worms.
Bugs.	Tape worms.
Ticks.	
Jawless lamprey.	

3
1. • Mutualism.
   • It occurs when nodular bacteria get benefit from leguminous plants by fixing nitrogen in an inorganic form to provide the plant with it. , while the plant provides bacteria with sugar.
2. • Predation.
   • It occurs when spiders make woven to catch insects.

Lesson 2

1
1. d. stars. 2. a. natural
3. c. air. 4. c. deers.
5. d. The universe. 6. b. water pond.
7. b. imbalance.
8. a. environmental balance.
9. b. disturbance. 10. d. continuous
11. d. saprophytes. 12. c. balance
13. d. changing of natural circumstances
14. b. balance 15. b. organizes
16. a. Dinosaur
17. d. all the previous answers.
18. c. competition 19. a. preys numbers
20. a. fungi. 21. d. recycle
22. d. dead organisms.

2
1. (✓)
2. (✗) .... environmental imbalance.
3. (✓) 4. (✓)
5. (✓) 6. (✓)
7. (✗) .... balance within the ecosystem.
8. (✗) The imbalance of ....
9. (✗) .... leads to the environmental imbalance.
10. (✓) 11. (✓) 12. (✓)
13. (✗) .... , competition appears among preys populations.
14. (✗) Dinosaurs ....
15. (✓) 16. (✓)

3
1. Ecosystem.
2. Environmental balance. 3. Extinction.
4. The universe. 5. Predators.
6. Dinosaur.
7. Competition. 8. Predation.
9. Saprophytes (saprophytic organisms).

4
1. living organisms – non-living things.
2. a water pond – a forest – the universe.
3. natural – living organisms – non-living things.
4. environmental balance.
5. natural changes – man interference.
6. cutting down trees – burning forests
7. Natural changes – man interference
8. appearance of other organisms – environmental imbalance.
9. Predation 10. weak – sick
11. preys – food 12. Dinosaurs.
13. Bacteria – fungi
14. Saprophytic organisms (saprophytes) – dead organisms
15. carbon – nitrogen – saprophytic

5
1. To absorb water and salts to make their own food by photosynthesis process.
2. Due to natural changes or man interference.
3. Due to the change in the natural conditions in the ecosystem that causes the disappearance of dinosaurs.
4. Because it causes disappearance of some organisms and appearance of other organisms.



5. Due to the insufficient food resources for preys.
6. Because they help preys to get rid of weak or sick members and let the strong ones to reproduce adding strong members to the population.
7. Because predation organizes the numbers of preys, populations.
8. Because they help the environment in getting rid of bodies of dead organisms and recycle the chemical elements found in the bodies of dead organisms to the environment to make other organisms benefit from them.

6
1. The number of rabbits will increase, so the food resources become insufficient (not enough) for rabbits that leads to competition between them, so rabbits will die.
2. A disturbance in the environmental balance will take place.
3. A disturbance in the ecosystem will take place causing a disappearance of some organisms, an appearance of other organisms and environmental imbalance.
4. A competition appears among the predators that feed on herbivorous, so the number of predators will decrease.
5. The number of preys increases and the food resources become insufficient for preys that leads to the competition between preys, so they will die.
6. The environmental imbalance will occur.
7. A competition takes place between preys to get food and shelter and this causes their death.
8. – The Earth's surface will be covered with the bodies of dead organisms.
   – Chemical elements found in the bodies of dead organisms will not be recycled to environment.
9. The other living organisms cannot get benefit from these elements.

7
1. The plants depend on the soil to absorb water and salts from it to make its own food by photosynthesis process.
2. Animals feed on plants to get food and energy.
3. Some animals feed on other animals to get food and energy.

8
1. It is any natural area including living organisms (as plants and animals) and non-living things (as water, soil and air).
2. It is the balance among the components of ecosystem.

9
1. Predation organizes the number of preys, population where, predators help preys to get rid of weak or sick members and let the strong ones reproduce adding strong members to population.
2. Saprophytic organisms help the environment in:
   a. Getting rid of the bodies of dead organisms by decomposing them.
   b. Recycling the chemical elements found in the bodies of dead organisms (as carbon, nitrogen and phosphorus) to the environment to make other living organisms benefit from them.

10 Saprophytic organisms can be used in:
(a) **Food Industry** as in making cheese , bread, yoghurt and vinegar.
(b) **Drugs Industry** as in manufacturing of some drugs as antibiotics.
(c) **Leather tanning Industry.**

Timss Questions

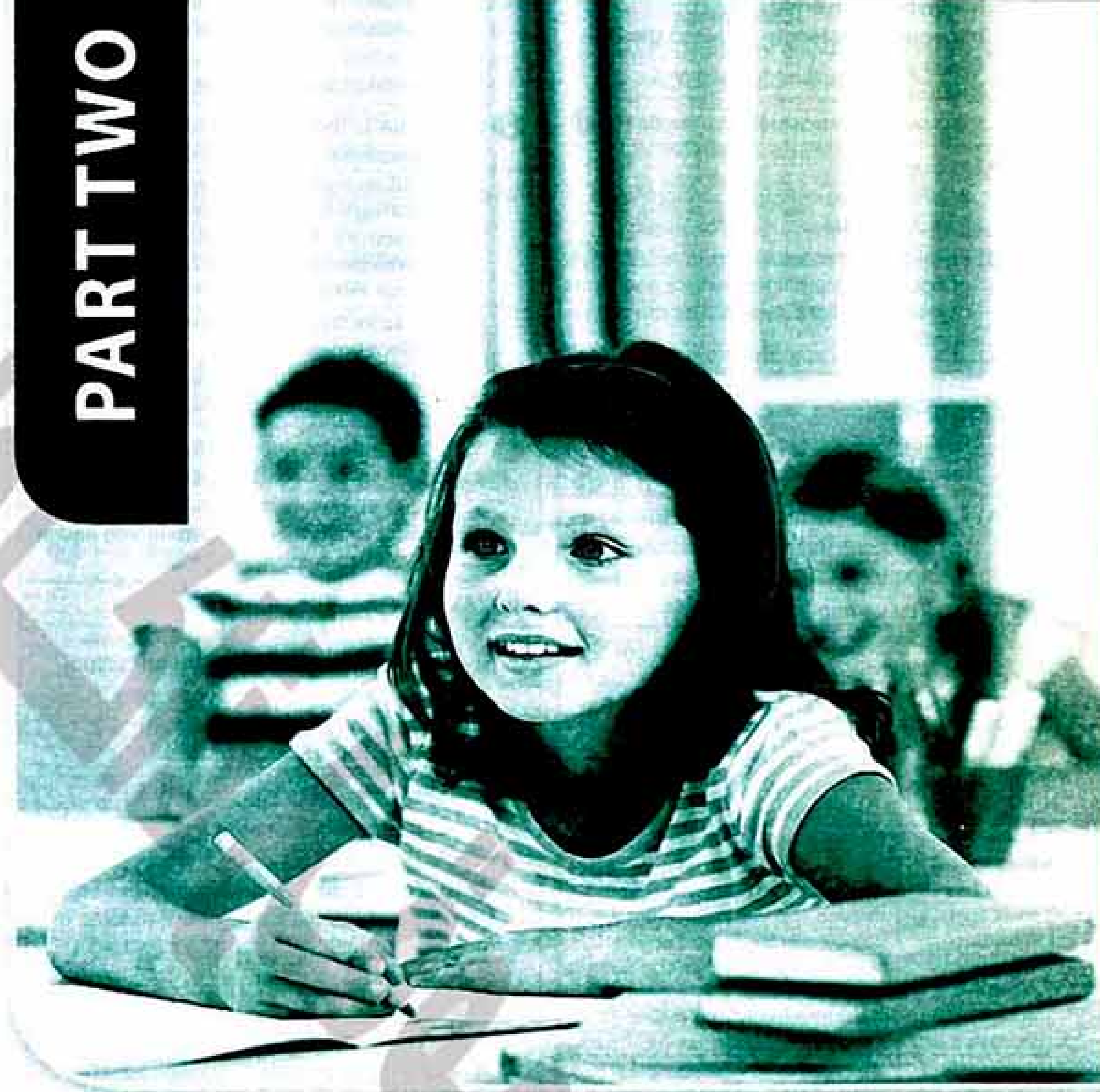
1
1. a. environmental imbalance.
   b. man interference.
   c. Natural changes – man interference

2
a. the environmental.
b. A disturbance in the environmental balance occurs.
c. The number of deers will increase and competition appears among them to get food, so they will die causing an environmental imbalance.

3 Other living organisms benefit from these elements.

PART TWO

Guide Answers of Test yourself



Test yourself 1

1
1. The visible spectrum
2. minimized – inverted.
3. transparent materials – frosted glass – tissue paper
4. Shadow
5. transparent – translucent 6. Moon

2 (A) 1. c. straight
2. a. travelling of light in straight lines.
3. a. transparent 4. d. foil paper.

(B) Formation of shadow is due to travelling of light in straight lines, where the nearer object to the light source has the bigger shadow.

3
1. Translucent materials.
2. Opaque material.
3. The Sun. 4. Shadow.
5. Transparent materials.

4 (A) 1. I can see the flame of the candle.
2. I can't see the flame of the candle.
3. Light travels in straight lines.

(B) 1. - Tissue paper.
- Opaque materials.
2. - Wood.
- Transparent materials.

5 (A)

Transparent material	Translucent material	Opaque material
It is the material which lets most light pass through and objects can be seen clearly through it.	It is the material which lets some light to pass through and objects can be seen through it less clearly than the transparent one.	It is the material that doesn't allow light to pass through and objects can't be seen through it.
Examples: Air, water and clear glass.	Examples: Frosted glass and tissue paper.	Examples: Wood and foil paper.

(B) 1. I can't see the flame of the candle.
2. I can see the picture clearly through it.

Test yourself 2

1
1. light reflection. 2. 80
3. a regular – an irregular 4. refracts
5. separation (splitting) of white light.
6. red – violet
7. A source of light – a reflecting surface

2 (A) 1. Due to the refraction of light.
2. Because the drops of water in air act as a glass prism which splits the sunlight into seven spectrum colours.
3. Because the mirror makes a regular reflection for the light rays falling from your image on it.

(B) 1. It splits the white light into seven spectrum colours.
2. They are used to cover windows of darkened photographic rooms.

3
1. a. light reflection. 2. a. white
3. b. orange. 4. d. 20
5. a. sunlight passes from the drops of rain water to air, then its splitting into seven spectrum colours.

4 (A) 1. (✓)
2. (✗) In the regular reflection, ...
3. (✗) .... is called light refraction.

(B) 1. reflection
2. regular reflection
3. irregular reflection

5 (A) 1. Separation of light.
2. Light refraction.
3. Rainbow.

(B) 1. Red. 3. Yellow. 4. Green.
5. Blue. 6. Indigo. 7. Violet.

Test yourself 3

1
1. white light. 2. Coloured opaque
3. the red colour
4. a white opaque object – a black opaque object
5. reflects – yellow
6. the blue light.
7. Coloured opaque object – coloured transparent object

2 (A) 1. Because white clothes reflect all light colours that fall on them causing the decrease of feeling of heat.
2. Because they absorb all light colours and permit their own colour only to transmit through.
3. Because white object reflects all light colours that fall on it.

(B) (1) Red. (2) Black.

3
1. Glass prism. 2. White opaque objects.
3. Seven spectrum colours.
4. Coloured transparent object.
5. Coloured opaque object.

4 (A) 1. (✗) 2. (✗) 3. (✗)

(B) 1. The strawberry fruit absorbs all light colours and reflects the red light only.
2. The black object appears black, because it absorbs all light colours that fall on it.

5
1. d. blue.
2. b. absorbs all light colours and allows the green colour only to pass through
3. a. White opaque object
4. a. all light colours and reflects the red colour only.
5. b. the transmitted light colour.

Test yourself 4

1
- Observation on fig. (a) : The apple appears black.
- Observation on fig. (b) : The apple appears red.
- Inference : The opaque object is seen in its real colour when you look at it from a transparent object that has the same colour.

2
1. Red - green - blue
2. Yellow - magenta - cyan
3. red - blue 4. red - black

3 (A) 1. Because they are produced by mixing two of the primary coloured lights.
2. Because it can't be produced by mixing two of the other coloured lights.
3. Because the yellow banana reflects the yellow colour which is absorbed by the green glass sheet and doesn't transmit through it, so the banana seems black.

(B) 1. Cyan light colour is produced.
2. White light colour is produced.

4
1. a. yellow.
2. b. Primary coloured lights
3. b. red and blue 4. a. black.
5. a. Red and green.

5 (A) 1. the primary coloured lights.
2. ① Red. ② Blue.
③ Cyan. ④ White.

(B) 1. White light.
2. Secondary coloured light.

Test yourself 5

1
1. b. reflects all light colours
2. b. nearer
3. c. magenta
4. d. regular reflection
5. c. blue

2 (A) 1. Because the book is an opaque material that doesn't allow light to pass through.
2. Because the orange reflects the orange colour which is absorbed by the green glass sheet and doesn't transmit through it, so the orange seems black.
3. Because it consists of seven colours called spectrum colours.

(B) 1. A minimized and inverted image for the candle flame is formed on the semi-transparent paper.
2. The formation of images through narrow holes is due to the travelling of light in straight lines.

3
1. red - green
2. Rainbow - splitting (separation)
3. reflect. 4. refracts - different
5. blue. 6. red - black

❹ (A) 1. (✗) .... on a smooth surface.
2. (✗) .... and blue light ....
3. (✗) .... is a translucent material.
(B) 1. Irregular reflection.
2. Opaque material.

❺ (A) 1. The spoon seems broken due to the reflection of light.
2. The black T-shirt absorbs all light colours and doesn't reflect any colour, so it appears black.
3. No shadow is formed.
(B) 1. Yellow.
2. Frosted glass.

Test yourself 6

❶ 1. Magnesia – iron. 2. natural - artificial
3. North pole – south
4. non-magnetic materials – magnetic materials.
5. two magnetic poles – middle

❷ (A) 1. Because it always points to the north direction of the Earth, but the other points to the south direction of the Earth.
2. Because it is attracted to the magnet.
(B) 1. The magnet has two poles.
2. The freely moving magnet always takes a fixed direction which is north - south direction.
3. The similar magnetic poles repel each other, but the different magnetic poles attract each other.
4. The magnet is surrounded by an area called magnetic field.

❸ 1. b. iron 2. a. north
3. c. Cobalt 4. c. two poles
5. b. magnetic field.

❹ (A) 1. (✗) Iron ....
2. (✗) .... has two poles.
3. (✓) 4. (✓)
(B) a. Magnetic needle.
b. Bar magnet.

❺ (A)

Magnetic materials	Non-magnetic materials
Iron nails - nickel - cobalt.	Wood - plastic - aluminium.

(B) • Chalk.
• chalk is a non-magnetic material, while the other materials are magnetic materials.

Test yourself 7

❶ (A) 1. North pole. 2. Magnetic field.
(B) 1. The magnetic needle takes a fixed direction which is north-south direction.
2. The two poles attract each other.
3. The iron filings are arranged around the magnet in a regular way and assembled at the two poles of the magnet.

❷ 1. repel – attract
2. The compass – fixed axis.
3. William Gelbert – the compass.
4. magnetic materials.
5. Magnetic force – magnetic
6. the two poles

❸ (A) 1. Because its north pole points to the north direction of the Earth and its south pole points to the south direction of the Earth.
2. Because the like magnetic poles repel each other, while the dislike magnetic poles attract each other.
3. Because it is used to locate the main four geographical directions.
(B) 1. (✗) .... to the south direction of the Earth.
2. (✓)

❹ (A) 1. c. small light magnetic needle
2. b. cobalt.
(B) It is the ability of the magnet to attract the magnetic materials existed in its field.

❺ (A)

Points of comparison	Magnetic materials	Non-magnetic materials
Definition :	They are the materials which are attracted to the magnet.	They are the materials which are not attracted to the magnet.
Examples :	Iron - steel - cobalt.	Chalk - glass - paper.

(B) - **Its composition:**
It consists of a light and small magnet (magnetic needle) that can spin freely around a fixed axis.
- **Its useage:**
It is used to locate the main four geographical directions.

Test yourself 8

❶ 1. Glass - aluminium
2. minimized - inverted
3. transparent - translucent
4. repel - unlike
5. refracts
6. north-south

❷ (A) 1. The iron nails are not attracted to the middle of the magnet.
2. It reflects regularly.
(B) 1. Magnetic materials.
2. Translucent materials.
3. The compass.

❸ 1. c. darkened 2. d. black
3. c. spectrum colours
4. d. south 5. The Sun

❹ (A) 1. Because light travels in straight lines.
2. Because white clothes reflect all light colours that fall on them causing decrease in the feeling of heat.
3. Because they are attracted to the magnet.
(B) 1. two
2. red

❺ (A) 1. c 2. d 3. b 4. a
(B) 1. It is used to identify the main four geographical directions.
2. It separates white light into seven colours called spectrum colours.

Test yourself 9

❶ 1. the electromagnet. 2. deflects.
3. The electromagnet
4. an electromagnet (temporary magnet).
5. the electric – magnetic
6. Big-sized winch (crane) – electric bell
7. Increasing the number of coil turns – increasing the number of batteries

❷ (A) 1. The wrought iron nail attracts the iron filings.
2. When an electric current passes through a coil winded around a wrought iron bar, the iron bar becomes an electromagnet.
(B) Big-sized winch (crane), electric bell, electric mixer, disc drive and television.

❸ (A)1. To increase the magnetic force of the electromagnet.
2. Because it is used in factories to lift the heavy iron or steel blocks and it is used in making many appliances as electric bell, electric mixer, disc drive and television.
3. Because the electric current has a magnetic effect, where it generates a magnetic field.
(B) *Look at the main book on pages (71).*

❹ (A) 1. The electromagnet. 2. The compass.
3. The electromagnet.
4. Big-sized winch (crane).
(B) 1. Increasing the number of coil turns.
2. Increasing the number of batteries.

❺ (A) 1. (✓) 2. (✓)
3. (✗) .... by increasing the number of batteries.

(B) 1. The iron nail becomes an electromagnet and attracts the paper clips.
2. The electromagnet loses its magnetism.

Test yourself 10

1
1. c. mechanical energy into electric energy.
2. d. (a) and (b).
3. b. copper
4. a. Faraday
5. b. Dynamo

2
(A) Electric current is generated in the copper wire.
(B) 1. It is used in making electric bell and electric mixer.
2. It is used to change the kinetic energy into electric energy.

3
(A) 1. Because by moving the magnet inside the coil, an electric current is produced.
2. Due to the generation of more electric current through the copper wire.
3. To generate large amount of electricity used for lightening cities and operating factories.
(B) 1. Using a strong magnet.
2. Increasing the number of turns of the moving coil.

4
1. Small dynamo in the bicycle – huge electric generator
2. electric current.
3. mechanical energy – electric energy.
4. using a strong magnet – increasing the number of turns of the moving coil.
5. small cylinder – a coil.
6. an electric

5
(A)

Natural magnet	Electromagnet
It is a black rock of one of the iron ores which is known as magnetite.	It is a device that used to convert the electric energy into magnetic energy.

(B)1. an electric current. 2. dynamo.
3. mechanical – electric
4. electricity – lightening cities and operating factories.

General Exercise of the School Book on Unit 1

1
1. compass 2. magnetic field
3. poles 4. repel 5. Unlike
6. electromagnet.
7. electric generator.

2
(A) 1. Irregular reflection.
2. Opaque materials.
3. Light refraction.
4. Spectrum colours.
5. Primary coloured lights.
6. Secondary coloured lights.
7. Magnetic materials.
8. Two poles of magnet (magnetic poles).
9. Dynamo.

3
(A) 1. (✓)
2. (✗) .... when the drops of rain water separate the sunlight.
3. (✓)
4. (✗) .... that travel through.
5. (✓)
6. (✗) .... the secondary colours.
7. (✓)
8. (✗) Iron gets ....
9. (✓)
10. (✓)
11. (✗) .... through a coil winding around a wrought iron bar.

Model Exam (1) on Unit 1

1
1. d. magnetic force.
2. a. the same colour
3. d. (a) , (b) and battery.
4. b. an irregular reflection.
5. b. passing more electric current.

2
1. Transparent materials.
2. Non-magnetic materials.
3. The huge electromagnet. 4. Rainbow.
5. White opaque object.

3
(A) 1. Because dark clothes absorb all light colours that fall on them causing the feeling of warmth.

2. Because the attraction force of the magnet is concentrated at the two poles of the magnet.
3. Due to passing the electric current in the wire.
(B) • Yellow is produced by mixing red and green coloured lights.
• Magenta is produced by mixing red and blue coloured lights.
• Cyan is produced by mixing blue and green coloured lights.

4
(A) 1. attract
2. repel
3. similar magnetic - different magnetic
(B) 1. (✗) 2. (✗)

5
(A) 1. transparent - translucent
2. green colour.
3. repel - attract
(B) d. Increasing the number of turns in the coil and the number of batteries.

Model Exam (2) on Unit 1

1
1. mechanical (kinetic) – electric
2. red – green
3. bigger
4. magnetic materials – non-magnetic materials
5. red 6. seven – glass prism.

2
(A) 1. (✗) 2. (✓)
3. (✓) 4. (✗)
(B) 1. A white light is formed.
2. The piece of wood is not attracted to the magnet.
3. The generation of the electric current in the coil of the dynamo increases.

3
1. Primary coloured lights.
2. The huge dynamo.
3. The visible spectrum.
4. Two poles of magnet (Magnetic poles).
5. The compass.

4
(A) 1. To avoid the attraction between the magnetic needle and the iron box of the compass.
2. Because it changes the electric energy into magnetic energy.
3. Because light travels in straight lines.
(B) 1. electromagnet.
2. absorbs

5
(A) 1. a. reflection
2. c. north-south
3. d. black
(B) 1. (a) Magnet.
(b) Coil.
2. electric current-lights

Test yourself 11

1
1. pure substance.
2. Mineral water – magnesium.
3. Evaporation process
4. magnetic attraction – filtration process – separating funnel
5. Separating funnel
6. shaking – grinding.

2
(A) 1. Mixture. 2. Magnetic attraction.
3. Evaporation process.
(B) 1. (✓)
2. (✗) We use filtration process to ....

3
(A) 1. Because air consists of more than one type of particles.
2. Because each of them consists of only one type of identical particles.
(B) 1. By using a magnet, iron filings can be separated.
2. Add water and stirring to dissolve the salt, while the sand precipitates.
3. By filtration process, sand can be separated from the salt solution.
4. By evaporation process, water evaporates and salt can be collected.

4
(A) 1. Mixture. – Salt and water.
2. Mineral water. – Mixture.
3. Table salt.
(B) 1. separating funnel. 2. water-oil
3. filtration process – evaporation process - magnetic attraction

5
(A) 1. It is used in formation of mixtures (solutions) such as salty solution.



2. It is used to separate the insoluble solid substances from solid-liquid mixtures.
(B) 1. Oil doesn't mix with water forming a layer over it.
2. No substance remains, because the distilled water is a pure substance.

Test yourself 12

❶ 1. Solute – Solvent – Solubility
2. homogeneous
3. heterogeneous a suspension.
4. chocolate – milk 5. Stirring – heating
6. Solvent

❷ (A) 1. Solvent. 2. Solubility process.
3. Suspension.
(B) 1. Quantity of solvent and solute.
2. Temperature. 3. Stirring or shaking.
4. The kind of the solute.
5. Grinding the solid materials.

❸ (A) 1. b. the amount of solute
2. c. Water
3. a. a homogeneous
(B) 1. Because by increasing the amount of solvent, the solubility time decreases.
2. Because as the temperature of the solution increases, the solubility speed increases.

❹ (A) 1. (✗) .... decreases ....
2. (✗) .... is a heterogeneous suspension.
3. (✓)
(B) 1. It is a homogeneous mixture in which the solute breaks down into its most basic particles and spread throughout the solvent.
2. It is the substance in which the solute dissolves.

❺ (A) 1. Dissolving 10 gm. of baking soda is faster than 20 gm. in the same amount of water.
Because: As the amount of solute decreases (in a certain amount of solvent), the solubility time decreases.
2. Dissolving sugar with stirring is faster than that without stirring.
Because: Stirring process decreases the solubility time.
(B) 1. temperature – solubility
2. decreases.

General Exercise of the School Book on Unit 2

❶ 1. It is the substance that consists of more than one type of particles.
2. It is a homogeneous mixture in which the solute breaks down into its most basic particles that spread throughout the solvent.
3. It is the process by which a solute dissolves in a solvent leading to the disappearance of the solute.

❷ - Fruitsalad solid-solid mixture) - Oil and water (liquid-liquid mixture) - Sand and water (solid-liquid mixture).

❸ 1. (✓)
2. (✗) .... increases .... 3. (✓)
4. (✗) .... increases ....
5. (✓). 6. (✓).

❹ 1. Heating on the burner is faster than that evaporation of sea water in sunlight.
Because the burner is hotter than the sunlight.
2. Dissolving of grinded solids before adding them to a liquid is faster than breaking them down into small pieces.
Because grinding the solid materials increses the speed of their solubility.
3. Dissolving of sugar grains is faster than cubes in water.
Because grinding the solid materials increases the speed of their solubility.
4. Dissolving salt in 300 ml. of water is faster than that in 100 ml. of water.
Because the increasing in the amount of solvent decreases the solubility time.

❺ a. Sugar. – Water.
b. Salt. – Water.

❻ 1. By using filter paper which separates mud and lets water pass.
2. By using filter paper which separates sand and lets water pass.
3. By evaporation process where, water evaporates leaving salt.
4. By evaporation process where, water evaporates leaving sugar.

❼ Evaporation-salt. – water.

Model Exam (1) on Unit 2

❶ (A) b. Powdered sugar will dissolve faster.
Because grinding the solid substances decreases the solubility time.
(B) By using a magnet, magnetic attraction separates iron filings from salt.

❷ 1. heterogeneous - homogeneous
2. shaking - stirring.
3. Fruit salad - soda water
4. decreases the solubility time
- increases the solubility speed.
5. Suspension–filtration process.

❸ (A) 1. Because increasing the temperature decreases the solubility time.
2. Because by evaporation process of salt solution, water evaporates and the salt remains, so it can be collected easily.
3. Because it consists of more than one type of particles.
(B) By using filter paper which separates coffee and lets water pass.

❹ 1. d. magnetic attraction.
2. a. increasing the solubility time.
3. a. filtration process.
4. d. tomato sauce.
5. a. A mixture of vinegar and water.

❺ (A) (2) Stirring ⟶ (1) Filtration
⟶ (3) Evaporation
(B) 1. The solute is salt and sand, while the solvent is water.
2. It decreases the solubility time.

Model Exam (2) on Unit 2

❶ (A) 1. Evaporation process.
2. Solution.
3. Heterogeneous mixture.
(B) 1. Evaporation process.
2. Filtration process.

❷ 1. carbon dioxide - oxygen
2. mixture - calcium
3. Filtration
4. a solute - a solvent - solubility
5. solute - solvent.

❸ 1. a. a magnet.
2. d. shaking process.
3. c. a separating funnel.
4. b. orange juice.
5. b. solvent.

❹ (A) 1. Because mineral water consists of more than one type of particles such as water, calcium and magnesium.
2. Because by using a magnet, iron filings are attracted to the magnet and separated from sand.
3. Because the particles of mud can be distinguished from water.
4. Because when the amount of solvent increases, the solubility time decreases.
(B) By increasing the temperature of the solution, the time of the solubility decreases.

❺ (A) 1. (✓) 2. (✓)
(B) 1. b 2. c 3. a

Test yourself 13

❶ 1. plant – animal
2. frog – chameleon.
3. Sepia
4. mimicry – camouflage
5. mutualism – commensalism – parasitism.

❷ 2. a. Frog 1. c. prey.
3. b. Cuttlefish 4. a. Mimicry
5. a. mutualism.



3 (A) 1. prey. 2. mimicry
(B) 1. Predation. 2. Predation
3. Mutualism.

4 1. Predation. 2. Camouflage.
3. Cuttlefish. 4. Mimicry.
5. Mutualism.

5 (A) 1. Because these plants prey some insects to get their required elements for making protein.
2. To hide when attacked by enemies.
3. To fear their enemies which get afraid from wasps and escape from them by mimicry phenomenon.
(B) Each of the leguminous plants and the nodular bacteria benefit from the other in form of food where:
- Nodular bacteria fix nitrogen in an inorganic form and supply the plant with it.
- Leguminous plants supply the nodular bacteria with sugar made by the plant during photosynthesis process.

Test yourself 14

1 1. b. commensalism.
2. c. malaria
3. d. liver worm.
4. b. small pox
5. c. decomposer

2 1. (✓)
2. (✗) .... is commensalism. 3. (✓)
4. (✗) .... elephantiasis disease to man.
5. (✗) .... decomposing the food remains.

3 1. Anaemia.
2. Bilharzia worm.
3. Flea.
4. Internal parasite.
5. Saprophytism.

4 (A)

Points of comparison	Commensalism	Parasitism
1. Definition:	It is a food relationship between two living organisms where, one of them benefits from the other, while the other neither gets benefit nor is harmed.	It is a food relationship between two different kinds of living organisms, where one benefits from the other and is known as the parasite, while the other is harmed and is known as the host.
2. Example:	The relation between sponge and the tiny aquatic living organisms.	The relation between ascaris worms and man.

(B) 1. Internal parasitism.
2. External parasitism.

5 (A) 1. Filaria worm. 2. Mosquitoe.
(B) 1. Because the tiny aquatic living organisms get food and shelter from the canals and fissures that found inside the sponge ,but sponge neither gets benefit nor is harmed.
2. Because the parasite will lose its source of food and shelter.
3. Because in parasitism, the parasite depends completely on the host to get its food and causes weakness to the host, but doesn't kill it as the predator does with its prey.

Test yourself 15

1 1. carbon – nitrogen.
2. cutting trees – burning forests
3. Bacteria – fungi 4. weak – sick
5. living organisms – non-living things.

2 (A) 1. The other living organisms can't get benefit from these elements.

2. The number of rabbits will increase, so the food resources become insufficient (not enough for rabbits) that leads to competition between them, so rabbits will die.
3. It causes disturbance in the environmental balance.
(B) 1. (✓) 2. (✓) 3. (✗) 4. (✓)

3 1. Predation. 2. Competition.
3. Ecosystem. 4. Predators.
5. Extinction.

4 (A) 1. It is any natural area including living organisms and non-living things.
2. It is the balance among the components of the ecosystem.
(B) Man benefits from saprophytic organisms in:
1. Food industry : in making cheese, bread and yoghurt.
2. Drug industry : in making antibiotics.
3. Leather tanning industry.

5 1. c. increase in number.
2. b. bond.
3. c. air.
4. a. preys' numbers
5. d. dead organisms.

General Exercise of the School Book on Unit 3

1 1. predation relationship.
2. decomposers.
3. man - internal parasities - the host.

2 1. wheat. 2. snake.
3. sheep and rat. 4. predation.

3 1. (✓) 2. (✗) 3. (✓)

4 1. Because lions feed on animals (as deers) which feed on green plants.
2. Because it lives inside man to get food and man is harmed.

5 Saprophytic organisms help the environment in :
a. Getting rid of the bodies of dead organisms by decomposing them.
b. Recycling the chemical elements found in the bodies of dead organisms (as carbon, nitrogen and phosphorus) to the environment to make other living organisms benefit from them.

6 1. It is any natural area including living organisms (as plants and animals) and non-living things (as water, soil and air).
2. It is the balance among the components of ecosystem.

7 1. b. producer 2. a. fungi.
3. c. sunlight 4. a. producer
5. b. parasitic

8 1. Predation. 2. Mutualism.
3. Commensalism.

9 1. A competition appears among the predators that feed on herbivorous, so the number of predators will decrease.
2. Death of all organisms.
3. A disturbance in the environmental balance will take place.
4. - The Earth's surface will be covered with the bodies of dead organisms.
- Chemical elements found in the bodies dead organisms will not be recycled to environment.
5. The number of preys (rabbits) increases and the food resources become insufficient for preys that leads to the competition between preys, so they will die.

Model Exam (1) on Unit 3

1 1. Predation. 2. Extinction.
3. Saprophytic organisms.
4. Mimicry 5. Internal parasite.

2 1. Animals feed on plants to get food and energy.
2. Internal parasitism. 3. Predation.
4. Commensalism. 5. Predation.

3 1. protein. 2. mutulalism.
3. carbon – nitrogen – saprophytic
4. natural – living organisms – non-living things.
5. predation.
6. small pox – anaemia

4 1. Predation.
2. To get its required elements for making protein.
3. The saprophytic organisms as bacteria and fungi help the environment in :
a. Getting rid of the bodies of dead organisms by decomposing them.
b. Recycling the chemical elements found in the bodies of dead organisms (as carbon, nitrogen and phosphorus) to the environment, to make other living organisms benefit from them.

5 1. c. mutualism. 2. a. Saprophytism
3. b. organizes 4. c. competition
5. a. Mimicry

Model Exam (2) on Unit 3

1 1. d. The universe. 2. c. host
3. d. (a) and (c) 4. b. disturbance.
5. d. all the previous answers.

2 (A) 1. to get their required elements for making protein.
2. To hide from its enemies by camouflage.
3. Due to the change in the natural conditions in the ecosystem that causes the disappearance of dinosaurs.
(B) 1. Environmental balance.
2. Dinosaurs.

3 (A)

Points of comparison	Predation	Parasitism
1. Definition:	It is a food relationship among living organisms, in which one living organism devours another one.	It is a food relationship between two different kinds of living organisms, where one benefits from the other and is known as the parasite, while the other is harmed and is known as the host.
2. Harms that occur to the host or prey :	The prey is killed in this relationship.	The host becomes weak.
3. Example :	The relationship between a cat and a rat.	The relationship between jawless lamprey and fish.

(B) 1. (x) 2. (x)

4 (A) 1. e 2. c 3. a 4. d
(B) 1. Predation. 2. recycle.

5 (A) 1. It simulates the colours of its surrounding environment.
2. It ejects a black fluid in the surrounding water.
(B) Internal parasites:
Ascaris worm - Liver worm - Tape warm.
External parasites :
Lice - Bugs - Mosquitoes.

PART THREE

Guide Answers of Final Exams



Cairo Governorate

1 St. Joseph's School

❶ (A) 1. (×) 2. (×)
3. (×) 4. (✓)

(B) 1. Glass prism.
2. It separates white light (sunlight) into seven colours called spectrum colours.

(C) 1. Because bilharzia worm benefits from its host which is harmed.
2. Because the moon light is the reflection of the sunlight that falls on its surface.

❷ (A) 1. Malaria disease.
2. Ecosystem.
3. Shadow.
4. Separating funnel.

(B) 1. a. magenta
2. b. commensalism.
3. a. ascaris worm.
4. b. magnetic field.

❸ (A) 1. solute – solvent.
2. Camouflage – mimicry
3. The electromagnet – small dynamo.
4. The temperature – water

(B) 1. It is the reflection of light when it falls on a rough reflecting surface, where the light rays are reflected and scattered in different directions.
2. It is the substance in which solute disperses or dissolves.

(C) 1. The spoon seems broken due to the refraction of light.
2. The two poles repel each other, because the like magnetic poles repel each other.

❹ (A) 1. d 2. c
3. b 4. a

(B)

Points of comparison	Transparent material	Opaque material
Definition :	It is the material which lets most light to pass through and objects can be seen clearly (in full details) through it.	It is the material that doesn't allow light to pass through and objects can't be seen through it.
Examples :	The clear glass – clear water – air.	Rocks – foil paper – wood – carton.

(C) 1. The compass needle deflects in the four positions after flowing the electric current through the wire.
2. The iron nail attracts the paper clips.

2 Manarat Al Maadi Language School

❶ (A) 1. Shaking – grinding
2. repel – attract
3. elephantiasis – small pox
4. electric – magnetic
5. butterflies – frogs.
6. the solvent – the solute.

(B) 1. Red. 2. Black.

❷ (A) 1. c. blue. 2. a. homogeneous
3. c. prey. 4. d. (a) and (c).

(B) 1. Because light travels in straight lines.
2. Because these plants prey some insects to get their required elements for making protein.
3. Because it consists of more than one type of particles such as nitrogen, oxygen and carbon dioxide.
4. Due to the refraction of light.

❸ (A) 1. Shadow. 2. Ecosystem.
3. The electromagnet.
4. Magnetic attraction.

(B) 1. Identify the main four geographical directions.
2. To separate the heterogeneous liquid mixtures.

3. It is used in making many appliances as the electric bell.
4. It separates white light (sunlight) into seven colours called spectrum colours.

❹ (A) 1. (×) Stirring decreases ....
2. (×) .... clear a glass.
3. (✓) 4. (✓)

(B) 1. It takes a fixed direction which is north-south direction.
2. A white light is formed.
3. The Earth's surface will be covered with the bodies of dead organisms.
4. Water evaporates leaving the salt in the cup.

3 Thebes Language School

❶ 1. kinetic – electric 2. red – violet
3. Water 4. commensalism.
5. repel – attract

❷ (A) 1. The compass. 2. Shadow.
3. Magnetic field. 4. Ecosystem.
5. Spectrum colours.

(B) 1. Because it doesn't allow light to pass through and objects cannot be seen through it.
2. Because each of them consists of more than one type of particles.
3. To hide from their enemies.

❸ (A) 1. b. Separating funnel
2. c. magenta 3. b. malaria
4. b. insectivorous 5. c. straight
6. a. increases.

(B) 1. (×) 2. (✓) 3. (✓) 4. (×)

❹ (A) 1. magnetic 2. internal
3. absorbs 4. irregularly
5. a homogeneous

(B) 1. It takes a fixed direction which is north-south direction.
2. The green object absorbs all light colours and reflects the green colour only so it seems green.

(C)

Points of comparison	Magnetic materials	Non-magnetic materials
Definition :	They are the materials which are attracted to the magnet.	They are the materials which are not attracted to the magnet.
Examples :	Iron – steel – cobalt.	Chalk – glass – paper.

4 Manaret Heliopolis Lang. School

❶ 1. straight – visible spectrum.
2. kinetic – electric
3. all – the red 4. plant – animal
5. salt – water
6. sugar – photosynthesis.
7. mimicry – camouflage.
8. repel – attract

❷ 1. The Sun. 2. Mutualism.
3. Opaque materials. 4. Ecosystem.
5. Shadow. 6. Light refraction.
7. Water. 8. Solubility process.

❸ 1. a. White opaque object.
2. a. gaseous-gaseous.
3. d. all the previous. 4. a. yellow
5. a. reflection 6. a. drosera.
7. a. filtration. 8. a. malaria

❹ (A) 1. Because it reflects the sunlight that falls on its surface.
2. Because each of them consists of only one type of identical particles.

(B) 1. (×) .... into seven spectrum colours.
2. (×) .... has two poles.
3. (✓) 4. (✓)
5. (×) .... by a separating funnel.
6. (×) .... are internal parasites.

5 Manor House International School

❶ 1. Natural changes – man interference
2. internal – external.
3. kinetic – electric
4. solute – solvent.



5. an electric current
6. reflects – absorbs
7. reflecting surface – air. 8. bigger

❷ (A) 1. Regular reflection. 2. Solvent.
3. Non-magnetic materials.
4. The compass.

(B) 1. It is used to separate the heterogeneous liquid mixtures (as water-oil mixture)
2. It is used to separate the solid-solid mixtures that contain magnetic substances.

(C) 1. Predation. 2. Saprophytism.

❸ (A) 1. The magnetic force is the ability ....
2. .... during raining.
3. .... is a homogeneous mixture.
4. .... in straight lines.

(B) 1. c 2. e 3. b 4. a 5. d

❹ (A) 1. To increase the produced amount of electricity.
2. Because thousands of solid materials dissolve in it.
3. Because it doesn't allow light to pass through and objects cannot be seen through it.
4. Because white clothes reflect all the light colours that fall on them causing the decrease of feeling of heat.
5. Because they can't be produced by mixing two of the other light colours.

(B) 1. a. predator.
2. c. north and south.
3. c. cyan.

6 Gomhouria Language School

❶ (A) 1. minimized – inverted.
2. repel – attract
3. Fungi – bacteria
4. kinetic – electric

(B) 1. It is used to identify the main four geographical directions.
2. It is used in making many appliances as the electric bell, the electric mixer.
3. It is used to separate white light (sunlight) into seven spectrum colours.
4. It is used to separate the heterogeneous liquid mixtures (as oil-water mixture).

❷ (A) 1. Transparent materials.
2. Ecosystem. 3. Magnetic field.
4. Solution.

(B) 1. Water evaporates leaving the salt in the cup.
2. Regular reflection of light.
3. Increasing the produced amount of electricity.
4. - The Earth's surface will be covered with the bodies of dead organisms.
- Chemical elements found in the bodies of dead organisms will not be recycled to the environment.

❸ (A) 1. Because thousands of solid materials dissolve in it.
2. Due to the refraction of light.
3. Because these plants prey some insects to get their required elements for making protein.
4. Because it is made by the effect of electricity.

(B) 1. By evaporation process.
2. By filtration process.

(C) 1. They are coloured lights that are produced by mixing two of the primary coloured lights.
2. It is the substance that is made of only one type of identical particles.

❹ (A) 1. c. white 2. a. decreases.
3. b. producer 4. c. north-south
5. b. elephantiasis

(B) 1. reflects 2. mixtures.
3. soda water.

Giza Governorate

7 Sakkara Language School

❶ 1. poles 2. refracts
3. mechanical – electric
4. Shaking – grinding
5. saprophytic 6. transparent

❷ 1. a. producer 2. b. north
3. a. organize 4. a. iron
5. c. solute. 6. c. Camouflage
7. a. Yellow. 8. a. Iron

❸ 1. (✓) 2. (✗) 3. (✓)
4. (✗) 5. (✓) 6. (✗)
7. (✗) 8. (✗)

❹ (A) 1. Visible spectrum.
2. Solvent. 3. Magnetic field.
4. Predation. 5. Mutualism.
6. Saprophytes.

(B) 1. Because they are attracted to the magnet.
2. Because plants are autotrophic organisms that can make their own food by photosynthesis process.

8 Smart Vision School

❶ 1. a. refraction 2. b. predator.
3. b. sugar. 4. b. reflects
5. b. electromagnet 6. a. glass prism
7. c. opaque 8. c. white

❷ (A) 1. Solute. 2. Predation.
3. Light reflection.
4. Magnetic materials.
5. Ecosystem.

(B) 1. Magenta. 2. Filtration.
3. Fish.

❸ (A) 1. Because it consists of more than one type of particles such as oxygen gas, nitrogen gas carbon dioxide gas and water vapour.
2. Because thousands of solid materials dissolve in it.
3. Because it ends up by devouring the prey or a part of it.

(B) 1. camouflage. 2. black
3. opaque 4. wheel tire
5. filtration.

❹ 1. Solvent – Solute
2. Blue – Green
3. plant animal
4. unlike – like.

9 Sun Gate Language School

❶ 1. c. parasitism 2. a. Yellow
3. b. pure substance. 4. b. camouflage.
5. b. dynamo 6. c. Blue
7. a. Predation 8. c. cobalt

❷ (A) 1. Light reflection.
2. Environmental balance.
3. Primary colours.
4. Solute.
5. Magnetic force.

(B) 1. Because thousands of solid materials dissolve in it.
2. Because plants are autotrophic organisms that can make their own food by photosynthesis process.
3. Because like magnetic poles repel each other, while dislike magnetic poles attract each other.

❸ (A) 1. It is used to identify the main four geographical directions.
2. It is a device used to separate the heterogeneous liquid mixtures.
3. It separates white light (sunlight) into seven spectrum colours.
4. It is used in our daily life in making the magnetic compass and the electric generator (dynamo).

(B) 1. living organisms – non-living things.
2. Solvent – Solute
3. predator – prey.
4. Black – white

❹ (A) 1. Green. 2. Iron.
3. Fleas. 4. Frosted glass

(B) 1. (✓)
2. (✗) ...... is a gaseous-liquid mixture.
3. (✗) ...... malaria disease.
4. (✓)

10 Moharram Islamic Language School

❶ (A) 1. Separating funnel. 2. Mixture.
3. Predation. 4. Dynamo.



(B) 1. Because it preys some insects to get its required elements for making protein.
2. Air is transparent because it allows most light to pass through and objects can be seen clearly through it, while rock is opaque because it doesn't allow light to pass through and objects cannot be seen through it.

❷ (A) 1. (×) 2. (×) 3. (×) 4. (✓)
(B) 1. d. evaporation. 2. b. cyan 3. a. faster than 4. a. aluminium.

❸ 1. area of land – forest.
2. seven – spectrum colours.
3. winter – summer.
4. pure substance – mixture.

❹ (A) 1. b 2. c 3. d 4. a
(B) 1. It is used to identify the main four geographical directions.
2. It is used in making cranes (big-sized winches) to move (lift) the heavy iron blocks in factories.

Alexandria Governorate

11 Franciscan Sisters School

❶ (A) 1. electric – magnetic
2. stirring – shaking.
3. protein
4. magnetic – non-magnetic
5. refracts.

(B) 1. To avoid the attraction between the magnetic needle and iron box.
2. Because it consists of seven spectrum colours.
3. Because red apple absorbs all light colours and reflects the red colour only, which passes through the red glass sheet so apple appears red.
4. Because filtration process is used to separate the solid materials that are insoluble in water, salt is soluble in water so it isn't separated by filtration process.

❷ (A) 1. Dissolving of salt in 300 ml. of water is faster than that in 100 ml. of water. Because the increasing in the amount of solvent decreases the solubility time.
2. Dissolving of sugar grains in water is faster than that of sugar cubes. Because grinding of solid materials increases the speed of their solubility.

(B) 1. Magnetic field.
2. Solubility process.
3. Opaque materials.
4. Environmental balance.

(C) 1. decreases
2. The electromagnet
3. evaporation process. 4. Iron

❸ (A) 1. It becomes a temporary magnet.
2. Yellow colour is produced.
3. It takes a fixed direction which is north-south direction.
4. I can see the picture clearly.

(B) 1. (×) ...... reflects all light colours ......
2. (✓)
3. (×) ...... repel, ... attract each other.
4. (×) Mineral water ......

❹ (A) 1.

Points of comparison	Predator	Prey
Definition :	It is living organism which devours other living organisms.	It is the devoured animal.
Example :	Lion	Deer.

2.

Points of comparison	Homogeneous mixtures	Heterogeneous mixtures
Definition :	They are the mixtures in which its components can't be distinguished from each other.	They are the mixtures in which its components can be distinguished from each other.
Example :	Salty solution.	Mud in water.

3. In some bees : By mimicry.
In frogs : By camouflage.

4.

Points of comparison	Regular reflection	Irregular reflection
Definition :	It is the reflection of light on a smooth and shiny reflecting surface, where the light rays are reflected directly in one direction.	It is the reflection of light on a rough reflecting surface, where the light rays are reflected and scattered in different directions.
Example :	Light reflection when it falls on any smooth surface as mirror.	Light reflection when it falls on any rough surface as white paper.

(B) 1. Mutualism. 2. Saprophytism.
(C) 1. water. 2. Ammeter 3. permit. 4. Sugar

12 Saint Vincent De Paul Shcool

❶ (A) 1. a. yellow. 2. c. iron 3. c. cobalt. 4. a. homogeneous 5. b. copper.
(B) 1. The idea of making dynamo.
2. a. Electric lamp. b. Magnet.

❷ (A) 1. Filtration process.
2. Solvent – Solute
3. refraction
4. malaria – fleas
5. magnetism

(B) 1. d 2. a 3. f 4. g 5. c 6. b
(C) 1. Rabbit.
2. Sugar.
3. Iron.

❸ (A) 1. Magnetic field. 2. Shadow. 3. Camouflage. 4. Insectivorous. 5. The electromagnet.
(B) 1. Because white objects reflect all light colours that combine together forming white light.
2. Because it is not attracted to the magnet.
3. Due to the refraction of light.

❹ (A) 1. (✓)
2. (×) ...... translucent ......
3. (✓)
4. (×) White ......
5. (×) ...... increases ......

(B) 1. It is separated to seven spectrum colours.
2. Water evaporates leaving the salt in the cup.
3. Two poles attract each other.
4. The leguminous plants cannot get nitrogen in an inorganic form.

(C) 1. It is used to identify the main four geographical directions.
2. It is used to separate the heterogeneous liquid mixtures.

13 Montaza Educational Zone

❶ (A) 1. a. predation 2. c. black. 3. b. secondary 4. a. Frog 5. b. Iron
(B) 1. a magnet – a coil.
2. an electric current.

❷ (A) 1. White 2. solute – solvent. 3. producer 4. Filaria
(B) 1. Ecosystem. 2. Shadow. 3. Regular reflection.

❸ (A) 1. (×) ...... keep their properties.
2. (✓)
3. (×) Separating funnel ......
4. (✓)
(B) 1. Mutualism. 2. Saprophytism. 3. Commensalism.

❹ (A) 1. Because thousands of solid materials dissolve in it.
2. Because light travels in straight lines.
3. Because they are not attracted to the magnet.
(B) 1. e 2. d 3. a 4. b 5. c



14 Taymour English Shcool

❶ (A) 1. irregular
2. the magnetic force
3. a common solvent
4. absorbs – yellow colour – reflected.
5. repel – attract
6. A frog – camouflage.

(B) 1. It is used to separate white light (sunlight) into seven colours called spectrum colours.
2. Tiny aquatic living organisms get food and shelter from the canals and fissures that are found inside the sponge.

❷ (A) 1. The solubility time increases.
2. The solubility time decreases.
3. The solubility time increases.

(B) 1. speed 2. red
3. proteins
4. kinetic

❸ (A) 1. Because vinegar and water are homogeneous mixture.
2. Because it is used to locate the main four directions.

(B) 1. Ecosystem.
2. Non-magnetic materials.
3. Evaporation.
4. Predation. 5. Shadow.

❹ (A) 1. Ascaris worm causes anaemia to man.
2. The biggest amount of iron filings is attracted to the two poles "the ends" of magnet and this amount decreases gradually until it disappears at the center of the magnet.

(B) 1. a. visible spectrum.
2. c. Tissue paper
3. c. mutualism.

15 Qaliubya Governorate

❶ (A) 1. kinetic – electric.
2. white
3. solute – water
4. Shaking – stirring
5. predation.
6. repel – attract.
7. red – violet.
8. regular – irregular.

(B) 1. The two poles attract each other.
2. The number of rabbits will increase, so the food resources become insufficient for rabbits that leads to competition between them, so rabbits will die.

❷ (A) 1. Ecosystem. 2. Magnetic field.
3. Shadow. 4. Saprophytism.
5. Mixture. 6. Solute.

(B) 1. Because they are attracted to the magnet.
2. Because thousands of solid materials dissolve in it.

❸ (A) 1. b. The Sun 2. c. Iron
3. a. organize 4. a. iron
5. d. electric 6. c. Camouflage

(B) 1. c 2. d 3. b 4. a

❹ (A) 1. (✓) 2. (✗) 3. (✗)
4. (✓) 5. (✗) 6. (✓)

(B) 1. Lion – Shark.
2. Mosquito – Lice.
3. Mushroom – Bread mold fungus.

16 El-Sharkia Governorate

❶ 1. repel – attract 2. green – blue
3. Wood 4. black
5. electric – magnetic

❷ (A) 1. Ecosystem. 2. Shadow.
3. Magnetic field.
4. Transparent materials.
5. The compass.
6. Solution.

(B) 1. Because it is attracted to the magnet.
2. Because thousands of solid materials dissolve in it.

❸ (A) 1. b. black 2. b. Filtration
3. c. Camouflage 4. a. Fungi
5. a. electric

(B) 1. (✗) 2. (✓) 3. (✓)

❹ (A) 1. predation. 2. yellow
3. mixtures. 4. straight

(B) 1. White light is formed.
2. The black opaque object absorbs all light colours and doesn't reflect any colour, so it appears black.

(C) 1. It is the balance among the components of ecosystem.
2. It is the light energy that can be seen.

17 El-Menofia Governorate

❶ 1. rainbow
2. mechanical – electric
3. minimized – inverted.
4. A magnet
5. Camouflage – mimicry

❷ (A) 1. Magnetic materials.
2. Mixture. 3. Prey.
4. Solubility process.
5. Ecosystem.
6. Magnetic field.

(B) 1. The apple seems black.
2. Shadow of hand is formed.

❸ (A) 1. a. yellow 2. c. chocolate.
3. a. faster than
4. b. the needle deflects.

(B) 1. c 2. a 3. d 4. b

❹ (A) 1. Because it doesn't allow light to pass through and objects cannot be seen through it.
2. Because it is used to identify the main four geographical directions.

(B) 1. fleas 2. increases
3. attract 4. nitrogen
5. reflect

18 El-Gharbia Governorate

❶ (A) 1. two poles – middle.
2. living organisms – non-living things.
3. heterogeneous – filtration process.
4. opaque – shadow
5. white (sunlight) – a glass prism.

(B)

	The living organism	Its type
1. Elephantiasis :	Filaria worm.	Internal parasite.
2. Small pox :	Flea	External parasite.
3. Rotten of bread :	Bread mold fungus.	Saprophyte.

❷ (A) 1. b. Iron 2. c. tire.
3. a. secondary 4. d. (a) and (b).

(B) 1. Because it ends up by devouring the prey or a part of it.
2. To increase the magnetic force of the electromagnet.

(C) 1. Drosera. 2. Bees.
3. Atmospheric air. 4. Water.

❸ (A) 1. Rainbow.
2. Commensalism.
3. Solubility process. 4. Magnetic field.

(B) 1. It is used to separate the solid materials which are soluble in water.
2. It is used in making cranes (big – sized winches) to move (lift) the heavy iron blocks in factories.
3. It is used to identify the main four geographical directions.
4. It is used to measure the electric current intensity.

❹ (A) 1. minimized. 2. competition
3. black 4. Saprophyties

(B) 1. The refraction of light.
2. Solubility time decreases.
3. It ejects a black fluid in the surrounding water.

(C)

Points of comparison	Regular reflection	Irregular reflection
Definition :	It is the reflection of light on a smooth and shiny reflecting surface, where the light rays are reflected directly in one direction.	It is the reflection of light on a rough reflecting surface, where the light rays are reflected and scattered in different directions.
Example :	Light reflection when it falls on any smooth surface as mirror.	Light reflection when it falls on any rough surface as white paper.



19 El-Dakahlia Governorate

❶ (A) 1. b. homogeneous 2. b. decomposer. 3. a. sunlight. 4. c. electric

(B) 1. Because they don't allow light to pass through and objects cannot be seen through them.
2. Because its north pole refers to the north direction of the Earth and its south pole refers to the south direction of the Earth.
3. Because the banana fruit absorbs all light colours and reflects the yellow colour only.
4. Because thousands of solid materials dissolve in it.

❷ (A) 1. (✗) Red, green, ...
2. (✓) 3. (✓)
4. (✗) .... small .... or large ....

(B) 1. Visible spectrum.
2. Mutualism.
3. Sodium carbonate.
4. Irregular reflection.

❸ (A) 1. two poles 2. glass prism
3. the electromagnet 4. extinction.

(B) 1.

Points of comparison	Magnetic materials	Non-magnetic materials
Definition :	They are the materials which are attracted to the magnet.	They are materials which are not attracted to the magnet.
Examples :	Iron – steel – cobalt.	Chalk – glass – paper.

2.

Points of comparison	Pure substance	Mixture
Definition :	It is the substance that is made of only one type of identical particles.	It is the substance that consists of more than one type of particles.
Examples :	Pure water – sugar.	Mineral water – concrete.

3.

Points of comparison	Transparent material	Opaque material
Definition :	It is the material which lets most light to pass through and objects can be seen clearly through it.	It is the material that doesn't allow light to pass through and objects can't be seen through it.
Examples :	Air – clear water.	Rocks – wood.

❹ (A) 1. A disturbance in the environmental balance will take place.
2. It takes a fixed direction which is north-south direction.

(B) Due to the refraction of light.

(C) 1. d 2. b 3. e 4. a 5.c

20 Ismailia Governorate

❶ (A) 1. mixture – pure substance.
2. mechanical – electric.
3. minimized – inverted.
4. repel – attract
5. grinding – stirring.

(B) 1. A disturbance in the environmental balance will take place.
2. The electromagnet loses its magnetic force and iron blocks fall down.
3. The yellow banana seems black.

❷ (A) 1. Ecosystem. 2. Visible spectrum.
3. Two poles of magnet.
4. Opaque materials.

(B) 1. e 2. a 3. b 4. d

❸ (A) 1. Compass.
2. The main four geographical directions.
3. A light and small magnet (magnetic needle) that can spin freely around a fixed axis.

(B) 1. Because thousands of solid materials dissolve in it.
2. Because the parasite will lose its source of food and shelter.
3. Because light travels in straight lines.

(C) 1. It is used to separate the heterogeneous liquid mixtures.
2. It is used to separate white light (sunlight) into seven spectrum colours.

❹ (A) 1. d. red + green
2. a. filtration. 3. d. Iron
4. d. the amount of solute
5. b. cranes.

(B) 1. Mutualism. 2. Predation.
3. Saprophytism.

21 Suez Governorate

❶ (A) 1. opaque material. 2. dynamo.
3. white light. 4. the north pole.
5. decreases 6. Dinosaur

(B) 1. Separating funnel.
2. Glass prism.

❷ (A) 1. Saprophytic organisms.
2. Secondary coloured lights.
3. Compass.
4. Solubility process.
5. Mutualism.
6. Ecosystem.

(B)

Points of comparison	Magnetic materials	Non-magnetic materials
Definition :	They are the materials which are attracted to the magnet.	They are materials which are not attracted to the magnet.
Examples :	Iron – steel – cobalt.	Glass – paper – wood.

❸ (A) 1. c. tire.
2. b. inverted minimized.
3. a. Yellow. 4. a. reflection
5. c. predator. 6. a. fungi.

(B) 1. It takes a fixed direction which is north-south direction.
2. A disturbance in the environmental balance will take place.

❹ (A) 1. (✗) 2. (✓) 3. (✗)

(B) 1. Because the moon light is the reflection of the sunlight that falls on its surface.
2. Because it consists of more than one type of particles such as nitrogen gas, oxygen gas, carbon dioxide gas and water vapour.

(C) 1. c 2. d 3. a 4. b

22 Port Said Governorate

❶ 1. grinding – stirring.
2. pass through them – reflect.
3. living organisms – non-living things.
4. repel – attract.

❷ (A) 1. c. mimicry
2. b. iron
3. c. parasitic
4. a. Green

(B) Because light travels in straight lines.

❸ (A) 1. Mutualism.
2. Magnetic field.
3. Dinosaur.
4. Light reflection.

(B) The white light is separated into seven spectrum colours.

❹ (A) 1. c 2. d 3. a 4. f 5.e

(B) magnet – magnetic substances.

23 Damietta Governorate

❶ (A) 1. living organisms – non-living things.
2. solvent – solute.
3. commensalism – mutualism.
4. electric – magnetic
5. shaking – grinding.

(B) 1. saprophytes. 2. red.
3. black

❷ (A) 1. The compass. 2. Dynamo.
3. Magnetic field. 4. Mimicry.
5. Non-magnetic materials.

(B) 1. Due to refraction of light.
2. Because it consists of more than one type of particles such as nitrogen gas, oxygen gas, carbon dioxide gas and water vapour.
3. Because these plants prey some insects to get their required elements for making protein.

3 1. a. a homogeneous 2. c. parasite.
3. d. the amount of solute
4. b. iron. 5. a. Yellow.
6. c. straight 7. elephantiasis
8. b. reflection

4 (A) 1. It is the balance amoung the components of ecosystem.
2. It is the material which lets some light to pass through and objects can be seen through it less clearly than the transparent one.

(B) 1. It simulates the colours of its surrounding environment.
2. The two poles attract each other.
3. The white light is formed.

(C) 1. By evaporation process.
2. By filtration process.
3. By magnetic attraction method.

24 Kafr El-Sheikh Governorate

1 1. primary coloured lights.
2. repel – attract
3. white light
4. shaking – grinding.
5. Solvent – Solute

2 1. a. producers 2. b. malaria
3. a. homogeneous 4. b. reflection
5. b. Chameleon 6. a. copper
7. c. Separating funnel
8. c. predator.

3 (A) 1. Light refraction.
2. Shadow. 3. Magnetic field.
4. Transparent materials.
5. The compass.
6. Mutualism.

(B) 1. Because thousands of solid materials dissolve in it.
2. Because light travels in straight lines.

4 (A) 1. (✗) 2. (✓) 3. (✗)
4. (✗) 5. (✓) 6. (✓)

(B) 1. By filtration process.
2. By magnetic attraction.

25 El-Behira Governorate

1 1. don't allow – allow.
2. Bilharzia worm – mosquitoes
3. Shaking – stirring.
4. organizes. 5. Sugar.

2 (A) 1. a. electric 2. a. carton.
3. c. white
4. c. light refraction.

(B)

Points of comparison	Magnetic materials	Non-magnetic materials
Definition :	They are the materials which are attracted to the magnet.	They are the materials which are not attracted to the magnet.
Examples :	Iron – steel – nickel.	Glass – paper – wood.

3 (A) 1. Regular reflection.
2. Magnetic field.
3. Solute.
4. Ecosystem.

(B) 1. Because the red apple reflects the red colour which is absorbed by the blue glass sheet, so the apple seems black.
2. To protect themselves from enemies.

4 (A) 1. the electromagnet.
a. wrought iron nail.
b. dry battery.
c. copper wire.
2. The iron nail attracts the iron filings.

(B) 1. The compass.
2. Separating funnel.

26 Fayoum Governorate

1 1. electric – magnetic
2. solute – solvent.
3. insectivorous – dionaea
4. repel – attract

2 (A) 1. The two poles.
2. Shadow.
3. Ecosystem.
4. Pure substances.
5. Visible spectrum.

(B) 1. It is used to separate white light (sunlight) into seven colours called spectrum colour.
2. It is used in filtration process, to separate insolube solid materials in water.

3 (A) 1. b. north and south.
2. a. small and inverted.
3. c. Sepia 4. c. mixture.

(B) 1. The magnet attracts the iron nails leaving the sand.
2. The spoon seems broken due to the refraction of light.

4 (A) 1. malaria 2. Faraday
3. increases 4. irregular

(B) 1. Because they are not attracted to the magnet.
2. Because it consists of more than one type of particles such as nitrogen gas, oxygen gas, carbon dioxide gas and water vapour.

27 Beni-Sueif Governorate

1 (A) 1. repel – attract
2. mechanical – electric
3. living organisms – non-living things.
4. Water

(B) 1. Because it consists of only one type of identical particles.
2. Due to the refraction of light.

2 1. The electromagnet.
2. Light reflection.
3. Environmental balance.
4. Predation.

3 1. c. straight
2. c. heterogeneous mixture
3. b. opaque
4. a. Milk

4 (A) 1. Transparent 2. secondary
3. small pox
4. wood

(B) 1. b 2. a 3. d 4. c

28 El-Minia Governorate

1 (A) 1. b. Sepia 2. a. primary
3. c. north. 4. a. opaque
5. a. solute.

(B)

Points of comparison	Regular reflection	Irregular reflection
Definition :	It is the reflection of light on a smooth and shiny reflecting surface, where the light rays are reflected directly in one direction.	It is the reflection of light on a rough reflecting surface, where the light rays are reflected and scattered in different directions.
Example :	Light reflection when it falls on any smooth surface as mirror.	Light reflection when it falls on any rough surface as white paper.

2 (A) 1. Iron 2. Dynamo
3. increases

(B) 1. Mutualism. 2. Commensalism.
3. Internally parasitism.

(C) It is used in electric power stations to generate a large amount of electricity used for lightening cities and operating factories.

3 (A) 1. Magnetic field. 2. Ecosystem.
3. Light refraction.
4. The compass.

(B) 1. Because it consists of more than one type of particles such as nitrogen gas, oxygen gas, carbon dioxide gas and water vapour.
2. Because it ends up by devouring the prey or a part of it.

4 (A) 1. c 2. d 3. b 4. a

(B) 1. The Earth's surface will be covered with the bodies of dead organisms.
2. The white light is separated into seven spectrum colours.

